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JOHN BEDDOE, Esq., M.D., F.R.S., *President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the AUTHOR.—La Formule de Reconstitution de la Taille d'après les os longs. Par M. Topinard.

—— Le Canon des Proportions du Corps de l'homme Européen. Par M. Topinard.

—— La Stéatopygie des Hottentotes du Jardin d'Acclimatation. Par M. Topinard.

—— Mensuration des Cranes des Dolmens de la Lozère d'après les registres de Broca. Par M. P. Topinard.

—— Un mot sur l'histoire de l'Anthropologie en 1788. Par M. Topinard.

—— Essais de Craniomètrie a propos du crane de Charlotte Corday. Par le Dr. Paul Topinard.

—— Présentation de quatre Boshimans vivants. Par M. Topinard.

—— L'Anthropologie de Linnée. Par Le Docteur P. Topinard.

From the Author.—Les Ossements de Spy et l'Ethnographie de la Tunisie. Rapport sur le concours du prix Broca. Par M. Topinard.

—— L'Anthropologie dans ses rapports avec la Zoologie. Par le Dr. Paul Topinard.

From the German Gesellschaft für Anthropologie, Ethnologie und Urgeschichte.—Archiv für Anthropologie. Band xix. Vierteljahresheft, 1, 2.

From the Berlin Gesellschaft für Anthropologie Ethnologie und Urgeschichte.—Zeitschrift für Ethnologie. 1889. Heft 4, 5.

From the Royal Scottish Geographical Society.—The Scottish Geographical Magazine. Vol. vi, No. 3.

From the Club.—Proceedings of the Berwickshire Naturalists' Club. 1888. Part 2.

From the Institute.—Transactions of the Wagner Free Institute of Science of Philadelphia. Vol. 2.

From the Society.—Proceedings of the Royal Geographical Society. Vol. xii, No. 3.

—— Journal of the Society of Arts. Nos. 1945–1946.

—— Journal and Proceedings of the Royal Society of New South Wales. Vol. xxiii. Part 1.

—— Catalogue of the Scientific Books in the Library of the Royal Society of New South Wales. Part 1. General Catalogue.

—— Bulletin de la Société Impériale des Naturalistes de Moscou. 1889. No. 3.

From the Editor.—Nature. Nos. 1061–1062.

—— Science. Nos. 368–369.

—— Revue Scientifique. Tom. xlv. Nos. 9–10.

Exhibition *of* Two Skulls *from a* Cave *in* Jamaica.

By Prof. W. H. Flower, C.B., F.R.S., &c.

Mr. W. Fawcett, Director of the Botanical Gardens of Jamaica, when on a recent visit to this country, brought with him two crania belonging to the Kingston Museum, which he has permitted me to exhibit to the meeting of the Institute before they are returned. The only history which Mr. Fawcett could give of them is that they were found by the Hon. Henry Shirley in Pedro Bluff Cave, Jamaica. It would be very desirable, if possible, to have further information as to the circumstances under which they were found, especially as to whether they were associated with other bones or with any objects by which their age could be identified. As the condition and colour of the two are entirely different, it is probable that they came into the cave at different times and had remained there under different conditions.

The cranium, of which I shall speak first, is of great interest, as it is undoubtedly that of one of the aboriginal races of America, and therefore in all probability one of the long vanished people who inhabited the island of Jamaica before the European conquest, and of whom we have such scanty traces remaining. It is that of a person, probably of the male sex and beyond middle age, many of the teeth having been lost during life, and the sagittal and lambdoidal sutures being partially obliterated; the mastoid processes, glabella, and supra-orbital ridges are strongly marked. The cranium has been artificially deformed during infancy in a very marked degree, according to the fashion most frequent along the whole of the west coast of America, *i.e.*, by depression of the frontal region, or fronto-occipital compression, with corresponding lateral expansion. This form of deformation is known to have been practised among the inhabitants of the West Indian Islands. In all essential features, the skull is purely American; indeed I see no characters by which it could be distinguished from one of those, now so abundant in collections, obtained from the old burying grounds on the sea-coast of Peru. The greatest length is 172 mm., the breadth 15 h., the height (basi-bregmatic) 124, giving a breadth-index of 895, and a height-index of 721; but their dimensions and indices are of course materially modified from the original by the artificial deformation. The face is remarkably characteristic, especially the high orbit (breadth 36, height 37, index 1028), and the form of the nasal bones, which, although not complete, still show the form so distinctive of the high-bridged American nose. The nasal height is 53, breadth 26, giving an index of 491. The basi-nasal length is 93, but the basi-alveolar length, and consequently the gnathic index, cannot be taken owing to the loss of the front teeth and absorption of the alveolar margin. The palate is broad and rounded, but for the same cause its dimensions cannot be given.

The second cranium presents a remarkable contrast, and is equally characteristic of another race which at a later period formed the mass of the population of this island, the African negro. It is not stained the same yellow colour as the other, but retains the natural greyish white of the bone tissue. It is that of a much younger person, not much above 20 years of age, as, though the basi-cranial suture is closed, all those of the upper surface of the cranium are open, and the third molars have evidently but recently come into place and are quite unworn. Its general characters are feminine. The nasals are small and flat. The nasal opening is not so wide as in negroes generally, and the nasal index consequently lower, but the inferior margin is characteristically rounded, and the nasal spine feebly

developed. There is marked alveolar prognathism. The forehead is smooth, with scarcely any supra-orbital ridge or glabella. The length of the cranium is 175 mm., the breadth 129, index 737; the height (basi-bregmatic) 133, index 760; the orbital breadth 38, height 34, index 895; nasal height 47, breadth 23, index 489; basi-nasal length 96; basi-alveolar length 99; gnathic index 103·1. The cranium presents no traces of artificial deformation.

DISCUSSION.

Mr. BOUVERIE PUSEY, referring to a suggestion that one of the skulls might be that of a Carib, called attention to the distinction between the Caribs on the one hand and the aboriginal race of Jamaica and the other large West India Islands on the other. He also expressed the opinion that the Caribs were not altogether extinct in St. Vincent and one or two of the other smaller Islands.

Dr. SUMMERHAYES said that he wished to corroborate what the last speaker had stated with regard to the Caribs. These people, variously termed *Galibis*, *Caraibs*, *Caripunas*, and by a Spanish corruption of the word "*Canibalos*" (whence our *Cannibals*), were simply a branch of the great "Tupi" family of Brazil—to whom they were related somewhat as the Northmen, Ostmen or Danes were to the Gothic tribes, who overspread Europe on the decay of the Roman power. The Caribs were a confederacy of pirates and slave hunters resembling the Masai of East Africa or the Saxons of Early English History rather than the peaceful traders of Bokhara to whom Humboldt likened them. They had the upspringing nasal bones, pointed out by Professor Flower in the skull before the meeting, and not the depressed nasals which were the common property of the Arowaks and the other unwarlike tribes of South America, with the Mongols of Asia. He could not explain the unusual association with a (female) negro skull, which he would like to regard as that of a primitive negroid, such as Quatrefages describes as existing in various parts of the American Continent, which according to him presents the same mixture of white, black and yellow races as Asia, only the yellow or Mongoloid type vastly predominates. The best account of the Caribs is to be found in the Ethnography of Martius, who in association with Spix made an exhaustive study of the South American races. The "Taini" or aborigines of the Antilles were soon killed off, and resembled, it is thought, the Arowaks.

The following Paper was read by the Secretary :—

Manners, Customs, Superstitions, *and* Religions *of* South African Tribes.

By Rev. James Macdonald, Reay, Caithness, N.B.

(*Second Paper.*)[1]

At the beginning of the present century there was but little known of the Zulu tribes who inhabited the coast region between the Tugela and Delagoa Bay. Few Europeans had visited the country, and the little intercourse between the natives and men of civilized nations consisted of occasional formal meetings for the purposes of barter. The natives brought down ivory and skins, and in exchange for these received from the traders such articles of European manufacture as they required.

About 1793 Dingiswayo, heir to the Abatetwa chieftainship, came as a fugitive to the Cape Colony. In 1797 and 1799 military expeditions were sent against various frontier tribes. The young chief was not an idle observer of passing events, and he seems to have taken the lessons of the expeditions deeply to heart. He observed that a small body of trained men could spread confusion and dismay through thousands of untrained savages, and resolved that, if he ever saw his native land again, he would have a standing army as the leading feature of his government.

On hearing of his father's death, Dingiswayo sent a message to his tribe that he intended to return and claim his rights. The message was followed by the news of his approach, and it was announced that he was mounted on an animal of wonderful strength, beauty, and speed. The Abatetwa had not yet seen a horse, and the *éclat* of their chief's return was heightened by his making his appearance on the strange animal. No sooner was he established in power than he organised a standing army on the European model.

In the meantime, Tshaka, the heir of Zululand, had to flee for his life from his father's ire, and sought an asylum with his kinsman, Dingiswayo. Under him he received that military education which has made his name famous.

When Tshaka became ruler of Zululand, he divided the kingdom into military districts, and placed his soldiers under a most rigid system of discipline. They could only marry with the king's consent, and any duty laid upon them they had to

[1] The first paper appeared in the "Journ. Anthrop. Inst.," vol. xix, No. 3, p. 264.

attempt, however hopeless its nature might be. There has probably never been a more perfect system of discipline than that by which Tshaka ruled his army and kingdom. At a review an order might be given, in the most unexpected manner, which meant death to hundreds. If the regiment hesitated or dared to remonstrate, so perfect was the discipline and so great the jealousy that another was ready to cut them down. A warrior returning from battle without his arms was put to death without trial. A general returning unsuccessful in the main purpose of his expedition shared the same fate. Whoever displeased the king was immediately executed. The traditional courts practically ceased to exist so far as the will and action of the tyrant was concerned. Such was the origin of that military organisation with which, for over a quarter of a century, he carried on a war of extermination against surrounding tribes, and devastated hundreds of miles of territory. This it was which gave colour to so many Zulu institutions, and made them such formidable foes when Lord Chelmsford's ill-starred expedition was crushed and almost annihilated under the heights of Isandhlwana.

One illustration of the fidelity demanded of Zulu soldiers will suffice: Among the bravest generals was one Mapopoma. His mother, Godase, and his brother, Sigwebana, fell under the king's displeasure, and their execution, as well as that of their immediate retainers and attendants, was entrusted to Mapopoma. Sigwebana was a general favourite, and got a hint of his danger. He immediately fled with his mother, but was intercepted by his brother with a detachment of soldiers before reaching the Tugela. A desperate conflict ensued, and Sigwebana with a few followers cut their way through and escaped. Godase returned and fled for safety to an American mission station. Mapopoma reported the matter to the king, and asked for further orders. The answer was laconic, "All must die." The detachment then marched to the mission, and regardless of Mr. Groute's protest, entered the house and dragged her out. She knew her end was come, and with all her native dignity followed the soldiers without a word, and at a short distance from the house suffered a cruel death. Beyond this barbarity could hardly be carried, and we do not wonder that Tshaka, in constant dread of intrigue, should have had all his own sons killed in infancy lest they should in after life give coherence to that disaffection which underlay the apparent prosperity of the kingdom. The hill of execution near his residence was never without carrion, and vultures sat on the surrounding trees day after day patiently waiting for the victims. The manner of execution was by repeated blows from a knobkerrie. So died Godase

under the hand of the son she had so carefully reared, and who, as one of the king's generals, was the pride of her old age.

Apart from the military organisation, the customs of Zululand differ in no essential from what is common to all the tribes. Omens are regarded with the same superstitious dread as they are farther south. If an owl, buzzard, turkey, or red-breasted eagle settles on the roof of a house, it is supposed to be sent by a malignant person who has the power of witchcraft, and that it is the harbinger of evil. The magician is called, and he purifies the place by sacrifice and sprinkling. The eagle referred to is sacred, and is never killed, though it carries away large numbers of domestic chickens and often kills young lambs and kids. The person killing one would become bald, and would be pursued by an evil fate to the end of his days. If a dog jumps on the roof of a house or lifts its leg against the doorpost it is a warning of coming calamity, and a magician is called. In this case the ordinary sprinkling is not performed. He chews certain roots, and filling his mouth with water, spits it about the door, roof, and walls of the hut. This is sufficient to avert any evil consequences. If a tree is struck by lightning the magicians dig it up by the roots and burn it. The ground is sprinkled as in the case of dwellings, but no sacrifices are offered, and there is no dancing. If a Pondo woman sees a spotted water-snake when fetching water, it is uncleanness to her. She drops her water vessel, and returning home, sits down in a corner of the hut with her face in her hands. When spoken to she makes no sign of having heard. If asked what is the matter she continues in the same attitude, and makes no reply. It is then known that she has seen the *inhlata*, and the witch doctor is called. On his arrival he performs mystic rites, after which he purifies not only the woman but the house, cattle-fold, and all the surrounding premises. There is no sacrifice, but it is customary to kill a beast in honour of the doctor's visit. Divination by lot is never practised among the coast tribes, all revelations being made directly to the magicians by the spirits in dreams and visions. Basutos divine by means of dice in many of their daily affairs and regarding the fortunes of war. Sleep is not forbidden except in connection with initiatory rites when young men are entering on manhood.

Guilds and Lodges.—Of separate religious and political associations we find little trace except among the hill men. The jealousy of the military organization or caste would prevent the existence of such among the Zulus, and the domestic life of the coast natives is so completely under control of the magicians, who form a distinct order, that no other lodge or guild can be said to exist as a separate institution. Among the mountain

tribes there are ceremonies by which youths are formed into secret guilds or lodges with pass words.[1] The members of these lodges are bound never to give evidence, under any circumstances, against one another. The rites of initiation are kept profoundly secret, but certain horrible customs performed on these occasions have become known. One of these customs is that of infusing courage, intelligence, and other qualities. Whenever an enemy who has acted bravely is killed, his liver, which is considered the seat of valour; his ears, which are considered the seat of intelligence; the skin of his forehead, which is the seat of perseverance; his testicles, which are the seat of strength, and other members, each of which is supposed to contain some virtue, are cut from his body and baked to cinders. The ashes are carefully preserved in the horn of a bull, and being, when required, mixed with other ingredients into a kind of paste, are administered to the youths by the tribal priest as a kind of bolus. By this means the virtue, strength, valour, and intelligence of the slain are imparted to them.

Intonjane.—In a former paper the rites of initiation into manhood were described, but consideration of the corresponding rites in the case of young women was deferred. These rites have such an important bearing on the domestic life of the people, and are besides so peculiar, that a somewhat detailed account is necessary. I am not aware that any reliable account of the ceremonies now under consideration has been published, and this is easily accounted for. Europeans are never, under any pretext, allowed to witness them, and natives rarely give a full and satisfactory description of what takes place. Only by comparing the accounts given by many different individuals can one arrive at a satisfactory conclusion, and feel that he has learned all the essential features connected with this period of a young woman's life. The subject is moreover a delicate one, and hardly suitable for the pages of any other than a scientific journal.

When a girl arrives at the age of puberty—first menstruation—a beast is killed as a thank-offering to the ancestral spirits, and high revel is held for several days. Dancing is continued nightly till those engaged in it are exhausted, or daylight arrives. Music is supplied by women beating on a dry hide and singing in unison. The girl takes no part in the rejoicings. For her a separate hut is set apart, and a small portion partitioned off at the farther end, in which she is secluded. A number of young girls from twelve to fourteen years of age

[1] Theal.

collect and remain as her attendants till the ceremonies are concluded. They begin by collecting a quantity of dry grass and covering the floor of the hut with a thick layer of it. They, after this is done, occupy the outer or larger portion, and there they sing day and night, ceasing only when quite overcome with sleep, and then only for a very short interval. No married man may come near the dwelling, and should anyone do so he is beaten away by the girls, who attack him most viciously with sticks and stones. During her seclusion the neophyte must on no account see or address any man, married or unmarried. She can address no one, not even the girls in attendance, except when absolutely necessary, and then in a whisper. She does no work, and must not converse about any of the ordinary affairs of every day life. Should she want food or drink she must not call her attendants, but tapping gently on the wall of the hut, attract their attention, and then in a whisper communicate her wishes. She must not anoint her body with fat as usual, and her hands and face may not be washed on any account. Bathing is out of the question. No bed clothing is allowed, and her garments are not changed till she resumes her ordinary mode of life.

After a few days and when dancing has been discontinued, young men and girls congregate in the outer apartment of the hut, and begin singing, clapping their hands, and making a grunting noise to show their joy. At night-fall most of the young girls who were the intonjane's attendants, leave for their own homes for the night, to return the following morning. Thereafter the young men and girls, who gathered into the hut in the afternoon, separate into pairs and sleep together *in puris naturalibis*, for that is strictly ordained by custom. Sexual intercourse is not allowed, but what is known as *metsha* or *ukumetsha* is the sole purpose of the novel arrangement. *Ukumetsha* may be defined as partial intercourse.

Every man who sleeps thus with a girl has to send to the father of the intonjane an assegai; should he have formed an attachment for his partner of the night and wish to pay her his addresses he sends two assegais. The second assegai is either returned after a few days as a sign that his advances are not acceptable to the girl's own father, or it is retained as a pledge of good faith. A breach of this promise, though on account of other domestic arrangements he may not be able to marry her as his first wife (his father settles that) is highly displeasing to the ancestral spirits, and they punish him in his person and property till appeased by costly sacrifices. The more assegais the father receives the greater man he is, and they are shown with pride, as evidence of the honour done to his daughter, and the esteem in which he is himself held.

After a farther period of seclusion, extending to about three weeks in all, the intonjane comes out of her apartment, and running as fast as she can, makes for the nearest stream or river, followed by her attendants. She makes the first plunge, and then they gambol and play in the water and on the banks nearly the whole day. While they are at the river the grass is removed from the hut and burned, to show that now the intonjane is clean and that she may associate with others. The hut is carefully cleaned and smeared over, both floor and walls, with fresh cow dung. Towards sunset the girl returns, followed by her companions singing and dancing. On entering the hut she sits in the middle of the floor, and her attendants, standing in a circle round her, sing a song peculiar to the occasion. This is the sign for the "wise" women to enter and greet the girl. This they do by beating the tips of her fingers with little wands and pronouncing certain words and forms of congratulation. She is next conducted outside the hut and asked to lie down on a mat prepared for her. The old women form a circle round her, and the men of the village stand a few paces apart. One by one the women kiss, first her cheeks, and after that her *mons veneris, labia,* and *nymphae.* Two of the wisest are deputed to examine the condition of the vulva and adjacent parts, and after they have performed a slight surgical operation she returns to her hut, now a woman.

The girls who were her attendants are now called and examined by the women. Should any of them be found not to be *virgo intacta,* they spit upon the labia and cry to the men who are standing by, "Here is a *thing.* We are spitting upon it." The men then approach and spit upon her in a similar manner. The women thrash her with saplings, and each man as he spits says, "Thrash on: she is foul." After being thus insulted and beaten, she is dismissed to her home in disgrace. The girls who are pure return to the intonjane, and after much merry-making the party disperse to their respective homes.

If menstruation should commence for the first time while a girl is walking, gathering wood, or working in the field, she runs to the river and hides herself among the reeds for the day, so as not to be seen by men. She covers her head carefully with her blanket that the sun may not shine on it and shrivel her up into a withered skeleton, as would result from exposure to the sun's beams. After dark she returns to her home and is secluded as already described. No cause is assigned for the appearance, continuance, or disappearance of the catamenia. It is, of course, observed that there is a connection between it and the period of fecundity. Among the Bacas women are secluded during the continuance of the flow, generally for a period of six

days, when they are not allowed to see or touch cow dung, which is in universal use for smearing floors after being swept. Should a man touch a woman during the period, his bones become soft, and in future he cannot take part in warfare or any other manly exercise.

Murder.—The relatives of a murdered man are not allowed to avenge his death, nor may they employ others to do so. Their wrong must be redressed after trial before the paramount chief and his council of state. To avoid feud and bloodshed, the respective parties to the case are strictly forbidden to go near one another's dwellings till after the case is finally disposed of. The chief, through the executive, takes all the necessary steps for a full inquiry and the attendance of all necessary witnesses. If the accused is found guilty the verdict may be manslaughter or murder. In the former case punishment is invariably by fine, which goes to the chief. When once the fine is paid the prisoner is free, and takes his place in society as if nothing had happened. The chief makes what compensation he deems right to the relatives of the murdered man, often sending only one cow. Should the verdict be premeditated murder, punishment is ordinarily by fine, but in this case a man may be "eaten up"; that is to say, the whole of his property, including his wives and children, may be confiscated, and he himself be deprived of his rights as a tribesman. This reduces him to the condition of a wanderer, and is equivalent to expulsion from the territory. The chief may restore his wives and family after a time, if that is deemed desirable. The weapon used is sent to the relatives of the victim, who, while they retain it, are supposed to be exempt from any further similar calamity. Among the coast tribes a murderer is not unclean in the ceremonial sense, nor does he undergo any process before being re-admitted to society. I am not certain regarding the custom in this particular among the hill tribes, but have heard it stated that he must pass through the hands of the priest. Murder is not a common crime, but manslaughter, in village brawls, is a thing of constant occurrence.

Doctrine of Souls.—Of all the subjects connected with savage and semi-savage life in Africa, the doctrine of souls is that which it is most difficult to understand fully and state clearly. After years of residence, and daily intercourse with the people, new phases of that mysterious region, the spirit world, present themselves, and the *corrections* of one's early and crude conclusions have to be re-corrected, and often new conclusions formed. Facts regarded as fixed and permanent, and accepted as such by one writer after another, have to be discarded as merely local or tribal, or even sub-tribal. From magicians belonging to the same tribe statements are heard differing so widely that it is

impossible to reconcile them, and often difficult to trace them to a common origin. Each magician gets his communications directly from the spirit world, and delivers them in the form of riddles or dark parables. If he has attained to eminence these are handed down by oral tradition, and his successors interpret his sayings as suits their own purposes. These traditions accumulate from one generation to another, and become in most cases a hopeless mass of confused and meaningless so-called revelations. There are, however, certain outstanding facts accepted by all. To these we must confine our attention.

All human beings have souls, and these are not supposed to be entirely confined to the body. A man's soul may be spoken of as occupying the roof of his hut, and if he changes his residence his soul does so at the same time. This is, however, but a loose and indefinite way of expressing the belief that a man's spirit may have influence at a distance from the place where he is himself at any time. There is a medicine in use among magicians which when taken enables a man to influence another at a distance by simply "willing." In the court at Tsolo, before J. P. Cumming, Esq., an important trial, which turned a good deal on the power of witchcraft, took place a few years ago. A witness declared that a man, after partaking of a certain medicine of which he produced a quantity, could influence any woman to come straight to the place where he was if he only knew her name, by "willing" to have her; his spirit went to her and called her, and no one can resist when called by a spirit. At the moment a young woman happened to be passing along the road opposite the court room windows. Mr. Cumming told the witness her name, and asked him to swallow a quantity of his medicine, and bring her up to the court. This challenge was too pointed, and was declined on the ground that the medicine did not act if there were any present who did not believe in its virtue, and the magistrate being an unbeliever, the experiment could not succeed. After that the case proceeded on other lines.

The whole spirit world is one of haze and uncertainty. No definite description of it can be got from anyone. A common word in use to express their ideas of human spirits and the unseen world generally is *izitunzela*, from *izitunzi*, shadows, and this is the nearest description that can be obtained. A man is constantly attended by the shadows or spirits of his ancestors as well as his own, but should a man die without speaking to his children shortly before his death, his spirit never visits his descendants except for purposes of evil. In such a case costly sacrifices are offered by the magicians or priests to prevent misfortune and death. The spirit leaves a

man's body by the mouth and nostrils with his breath, and can never return; "He can never look upon the sun again." In cases of illness, when one has been in a state of coma or lain unconscious for a time, it is said that "his spirit left him, but that he has returned to life again." This is not a final leaving or death, only a temporary departure. It is interesting to note that Africans never speak of a man as dead. The phrase is, "He is not here," or, "He will never look upon the sun again." This same reluctance to speak of a man as dead is still characteristic of parts of the north of Scotland. During the year and a half I have lived in Caithness, I have not even once heard the words "He is dead," or "He died," from a native of the country. The phrase invariably used is, "He is taken away," or, "He was taken away."

To dreams and visions Africans attach great importance, but no theory of their origin, beyond being referred to spirit influence, is given. Should a man dream the same dream more than once he consults the magicians, who profess to have much of their own revelations through dreams. They direct him how to act, and his superstitious fears are allayed after he has communicated his troubles to them, and left his case in their hands. If the dreamer sees a departed relative the magician says oracularly, "He is hungry." A beast is then killed as a quasi-sacrifice. The blood is carefully collected and placed in a vessel at the side of the hut farthest from the door. The liver is hung up in the hut and must not be eaten until all the flesh of the animal has been used. During the night the spirit is regaled and refreshed by the food thus provided, and eats or "withdraws" the "essence" that goes to feed and sustain spirits. After a specified time all may be eaten except the portions the magician orders to be burned; generally bones and fat.

The departed spirit ascends to heaven, and by so doing "goes home." Though there are superstitions about spirits inhabiting caverns, the roofs of houses, and other places or objects, the idea underlying it all is, that the spirit at death goes upwards to the spirit land. This is clearly shown by their usual form of prayer, which is, "Ye who are above, who have gone before, &c." These departed spirits revisit the world and are interested in all the affairs of men. They bring prosperity or the reverse according as they are revered and obeyed or not, and when there is any departure from custom their displeasure is dreaded as men dread the plague.

I once bought a disused cattle-fold for fuel from a Gcaleka, and after carting it home discovered that it had been struck by lightning, and that I might have had it for the taking. I sent for my friend and, to tease him, explained that all the evil that

was in the timber of his fold was transferred to the coins; "his wood was my money," and that his ancestors would not easily forgive his shallow attempt to deceive them for his own ends. In alarm he sent for a magician, who doctored the coins and appeased the spirits. After that no evil was to be apprehended and the money could be used, but had the doctor decided that the transaction could under no circumstances be legitimate, the purchase price would be as useless to him as were the decaying posts I had removed. It could neither be used by himself nor given to any other native.

Ancestor worship is not only professed by them, but they actually regulate their conduct by it. If a man has a narrow escape from accident and death, he says, "My father's soul saved me," and he offers a sacrifice of thanksgiving accordingly. In cases of sickness, propitiatory sacrifices are offered to remove the displeasure of the ancestors, and secure a return of their favour. Should anyone neglect a national custom in the conduct of his affairs, he must offer sacrifice to avert calamity as the consequence of his neglect. When offering propitiatory sacrifices the form of prayer used by the priest is: "Ye who are above, accept our offering and remove our trouble." In freewill offerings, as in escape from danger or at the ripening of crops, the prayer takes the following form: "Ye who are above, accept the food we have provided for you; smell our offering now burning, and grant us prosperity and peace."

The bodies of the dead, after burial, are sometimes supposed to take the form of the *Tukwakwa*—a deadly species of snake—which is never killed by the natives. This, however, is almost peculiar to the Zulus. The tribes farther south hardly ever refer to such transmigration, nor is there anything in their practices to lead one to think that such beliefs ever were prevalent among them.

Animals have no souls, but they "have a language, though no one has ever been able to understand it."[1] The owners of cattle and horses are constantly in the habit of addressing them as if they understood every word said, and I have at times fancied, so very knowing do they become, that they understand a great deal more than civilized people are apt to think. I have seen a horse show unmistakable signs of pleasure when praised, and suddenly drop his ears and walk away when told he was an ugly, troublesome, and useless brute. Inanimate objects have no souls, and are never addressed as animals are. Spirits, however, do reside in inanimate objects, and their presence there has an influence upon many customs and habits.

[1] Sutton.

During the rebellion of 1879, Umhlonhlo, after the murder of Mr. Hamilton Hope, the British Resident, was one day marching leisurely across country with his whole army. The forenoon was hot, and not a cloud could be seen in the sky. Presently the magicians noticed a peculiarly-shaped cloud on the horizon. It rose rapidly in one mass and "rolled upon itself." Its movements were intently watched till it approached the zenith and passed over the sun. This was an evil omen. For some unknown cause the spirits were mortally offended, and had come over the army in shadow at noonday. In grief and sorrow their backs were turned upon their children, and the result of this would be certain defeat and disaster. There was, however, no immediate danger. That morning scouts had reported that there were no troops within many miles of their line of march, and they could repair to some sacred place to offer sacrifices and make atonement. While they were discussing which place to repair to for this purpose, the van of a small column of cavalry appeared unexpectedly over a rising ground. Dismay struck into every heart. The war minister urged his men to form into order of battle. No one answered his summons. He did his best to organize an orderly retreat, but in vain; not a blow was struck, and every man took to his heels, making for the nearest hiding-place in mountain or forest. That army never reassembled. Black-hearted fear utterly demoralized it.

A few years ago something unusual had gone wrong—I do not at this moment recollect what it was—at Konke's great place. The magicians were called, and decided that a black ox must be shut up for forty-eight hours without food or water, and be released at noon on the second day. The spirits would then lead it to the river, where it would drink and put an end to the evil which was caused by malignant water demons. Thereafter the ox must be killed as a sacrifice to the spirit which led it to the water. An animal was duly consecrated for this purpose and shut up in a small fold by itself. At dead of night a young teacher, who had been trained at Lovedale, and there learned to estimate magicians at their proper value, probably out of sheer love of mischief, gave the ox a plentiful supply of water. At the appointed time the animal was released, but instead of hurrying to the river it began to graze quietly beside the fold, nor would it even be driven to the water. Konke's rage overcame his superstition for a moment, and ordering his attendants to "slay the beast," he turned to the chief magician and brandishing his assegai, hissed between his teeth, "Go from my sight, and if you let me see your face again I may forget that you are a doctor." So ended the sacrifice; not so the history of the ox. The animal was sacred for

sacrifice, and could not be eaten owing to the unceremonious manner in which it had been slain, and the dispersion of the magicians. That night the teacher, armed with a "gully," secured for himself as much beef as he could conveniently carry. Two days thereafter his missionary visited the school, and after the examination was regaled with prime beef steak, onions, and sweet potatoes. On making enquiries he heard the story as above related. Endless illustrations and examples could be given of the influence which ancestral or spirit-worship has upon the whole domestic, social, and intertribal life of Africa. It enters into the minutest details of daily work, and it influences the foreign policy of a whole people. It regulates family life, and it decides the fate of armies and the destiny of nations.

Closely connected with the doctrine of souls is that of other spirits than those of men. The spirits most commonly met with in African mythology are water or river spirits, inhabiting deep pools where there are strong eddies and under-currents. Whether they are all ever seen now-a-days it is difficult to determine, but they must at one time have either shown themselves willingly, or been dragged from their hiding places by some powerful magician, for they are one and all described. They are dwarfs, and correspond to the Scottish conception of kelpies or fairies. They are wicked and malevolent beings, and are never credited with a good or generous action. Whatever they possess they keep, and greedily seize upon anyone who comes within their reach. "One of them, the *Incanti*, corresponds to the Greek Python, and another, called *Hili*, appears in the form of a small and very ugly man, and is exceedingly malevolent."[1] It is certain death to see an Incanti, and no one but the magicians sees them except in dreams, and in that case the magicians are consulted and advise and direct what is to be done.

Another form of spirit may be mentioned in passing, and that is a quasi-guardian spirit attending the chief. He always has an ox which is a special favourite, and which must never be killed. By constant training and kindness it gets into the habit of leaving the other cattle whenever the chief is washing himself with medicine outside the cattle-fold. It stands close beside him and licks up all the froth, generally of an aromatic nature, spilt from the medicine basin. The spirit which guards him resides in this ox.

But to return to the river spirits. The places where they reside are dreaded and shunned, and no one cares to have

[1] Brownlee.

anything to do with them or to think of them when that can be avoided. When a person is drowned and no good cause can be assigned for the accident, it is said that he was "called by the river," which is equivalent to saying "the river demons." Anyone so called cannot resist the summons, and goes underneath in obedience to their will. The magicians when they appear on the scene may prescribe a *formal* sacrifice, but the animal is not killed, nor is devotional prayer offered as in the case of sacrifice to departed souls. The animal is simply driven into the river while the magician says:—"We offer sacrifice." An alternative form of this sacrifice is that of throwing handfuls of corn into the water while incantations are repeated. At other times the magicians decide that the spirit must be pelted with stones. Men then gather on the bank, and throwing stones into the water, shout the most abusive epithets at the spirits residing there. But these river spirits are true demons, and must not be thus interfered with except when there are magicians present to avert evil. For a similar reason it is necessary, when about to cross an unknown river, to throw something, though it may not be of value, into the water, both to avoid immediate evil and future sickness or death.

Some years ago a number of Gcaleka girls were, on a fine summer day, bathing in the Bashee. One of them got beyond her depth, and began to struggle in the water and cry for help. Her companions promptly raised the alarm, and two men working close by ran down to the water's edge. She was still struggling feebly, but to the onlookers it was a clear case of being "called" by the river, and they made no attempt to save her. The body was recovered by the magicians the same day, when it was found she had been drowned in less than five feet of water. All this came to the ears of C. G. H. Bell, Esq., the English Resident, and he cited the parties, magicians and all, to appear before him in court. The two men not only admitted that they could have waded to the spot where they saw her struggling, but also said the water would not be "more than breast deep." They had made no effort to save her, as it would be "improper and dangerous to interfere when one is called by the river." Mr. Bell tried to argue them out of such absurd notions, but to little purpose, and finally came to the conclusion that "six months hard" might be more effectual in eradicating superstition than all his philosophy, and six months hard it accordingly was.

Last year a girl was drowned in a small stream called the Mbulu, and the body having lodged under a bank, could neither be seen nor recovered by ordinary means. The relatives were in despair, and having driven an ox to the edge of the water,

stood there with the magician, who prayed:—"Give us our dead. We have brought sacrifice. It is not the dead we offer, it is blood." The demons made no response, and finally the Rev. J. Davidson, near whose house the accident happened, recovered the body by diving. This he did against the most earnest remonstrance on the ground that he would himself be "called."

One other anecdote and we shall bid farewell to the river spirits. On a sultry summer's day I came to the bank of the Tsitsa, and feeling hot and wearied, resolved to have a swim in the clear and cool water to refresh myself after a long ride. I made my intention known to my groom who accompanied me, but he strongly objected that there were dangerous water snakes in the Tsitsa. I pointed out to him that water snakes do not bite, but this did not satisfy him; the snakes of this particular river differed from others. I asked him if he could show me the grave of anyone who had been bitten by water snakes. This he could not do, so I called him a woman or some such insulting epithet, and told him to attend to the horses as directed. Matters now looked serious, and standing straight before me, he said with the greatest awe and solemnity:—"The truth is, master, there is a *Tikolosh* there, and if you go in you will be called, and what am I to say to the *inkosikase* (*i.e.*, the lady) when I go home for allowing you to go into the river?" I had my swim while my servant stood in mute terror on the bank, but had the Tikolosh been at home that day, these papers would never have been written.

It may be here mentioned that alongside the great footpath thoroughfares of the country there are found, at intervals, cairns or heaps of small stones. Travellers as they pass cast a small stone on these, and with uncovered head say, "Ah *sivivane*," *i.e.*, cairn, "grant us strength and prosperity." On being questioned as to the origin and meaning of these sivivane, they profess utter ignorance, and say it was always so among their people. It is probable that the prayer originally was to the great spirit or the soul of the first chief of some powerful tribe, but whether spirits reside in the cairns or not, no one can tell. Certain it is that they hear the prayer of their children when they observe the customs of their country. Another method of securing good fortune on a journey is, in wooded country, to place stones in the forks of trees by the roadside, and on grassy plains to twist tufts of grass into knots. These actions are regarded in the light of devotion, and are pleasing to the ancestors, who look with favour on their children when they thus conform to custom. It has been said of Africans, and that by theologians, that they have no religion of any kind. On the contrary the whole life of an African is regulated by his

religious fears and feelings, and if these differ in every particular from our conceptions of religious feelings and devotions, it does not make the fact less real or less significant.

There is no periodical process of purging or driving away spirits, and ordinary people, without the presence and aid of magicians dare not interfere with any spirits, however malignant and destructive to life and property they may become. Better leave a locality, and take up one's quarters at a distance, than do anything calculated to enrage demons and evil spirits which may have taken up their abode in the vicinity of human habitations. It is true that every man's life is guarded by the spirits of his ancestors, but this does not protect him either from demons, or wizards and witches. His life is not bound up with any object as totem or fetish, but he carries charms or articles of ornament that have been charmed by the magician, and these afford a measure of protection. A man can obtain charms to make him successful in predatory expeditions; to obtain the favour of his chief; the favour of women, and even the death of an enemy or rival. In this latter case the charms cannot be got from recognized magicians, they must be obtained from those who practice the illegal art and capital crime of witchcraft, and when discovery follows, both parties are condemned as equally guilty. The most commonly used charm is a necklet of cow-tail hair, twisted and knotted with specially prepared bits of wood. Each charm must be "doctored" for a special purpose, and is useless for any other than the one it was intended for.

In the war of 1846 (?) the magicians gave the soldiers, as a charm against English bullets, the blue flower of a species of rhododendron. Those who carried this talisman rushed forward against columns of infantry without a shadow of fear or hesitation, and only when men began to bite the dust in all directions did the nature of the delusion break upon the army, and panic ensue.

There is a custom lingering in odd corners, but whether it was once universal I have not been able to determine. The probability is that it was, and that originally it took the form of substitution for human sacrifice, when in a very remote past the Southern Bantu tribes discontinued the practice. What led to the abolition of human sacrifice it is impossible to determine, and conjecture is in all such cases unsatisfactory. It has been thought that decimation by war and disease so thinned out the population, that human life became too valuable to be destroyed with such awful frequency as sacrifices in time of war and distress demanded, and that an alternative form of offering was adopted. The custom referred to is as follows:—All sickness, misfortunes, and great loss or calamity must be

referred to the magicians. Their ordinary custom is either to "extract the disease" or to "smell out" the person who has bewitched the patient. Instead of adopting the latter practice, they sometimes state that the cause of the evil is a domestic animal, cow, ox, or bull. The beast must be killed by the magician's own hand and cooked at once. The flesh must be eaten at sundown, and the sick man must be the first to taste and partake of it. No portion must be removed to another dwelling, nor may the bones be given to the dogs, as is usually done. They must be carefully collected, and as carefully burned to cinders. It is also possible for the chief when a person is "smelt out" by the magician, to order an ox to be substituted for the victim and treated in the way above described. This is the only approach to the idea of a scapegoat of which I have heard, and the practice is far from common. I am not aware of one animal ever being substituted for one more valuable or difficult to procure.

When sacrifices are offered to the spirits of a man's ancestors or to the spirit land generally, as in the case of death by lightning, the idea is that the whole of the animal sacrificed is offered up, as well as the portions of bone and fat burned. The manner of procedure is as follows:—The flesh is cut up into small pieces, no portion being wanting, and placed in a hut, where it lies in a heap for a whole night. During the darkness the spirits feast on it and withdraw the "essence," which constitute spirit fare. On the following day it is cooked and eaten in the usual way. Among some tribes there is a custom of killing a bull as a special new year offering, and I notice this more to illustrate a peculiar manner of slaughtering the animal than as a national institution of any importance. After it is caught and thrown down, the left (?) fore-leg and shoulder is sliced off, and then the animal allowed to go and limp about on three legs. The flesh of the dismembered limb is immediately par-broiled on hot fires previously prepared, and eaten or swallowed at once, the bones being thrown into the fire as the flesh is torn from them. After this is done the animal, if not already bled to death, is dispatched and dressed in the usual way.

Heavenly bodies.—The science of astronomy is in a very primitive condition in Africa, and though we find every man a shrewd and accurate observer of certain weather signs, as well as the appearance and disappearance of stars as the earth travels on its course round the ecliptic, no explanation is offered beyond saying that at such and such a season a star, recognized and named, goes away to return again after so many moons.

Of creation they have no theory, for the simple reason that the earth and the heavenly bodies have always been as we see

them now, and that they will thus always continue, unless some terrestrial catastrophe should set the whole on fire, or in some other way "disperse everything."

The earth is an extended plane, and may be round-shaped like the sun and moon, probably is so, but no one can tell, as men have never been to the edge to walk round the circle and look over. If anyone did so he would become giddy by looking down into the chasm, and fall into the abyss. A hole, if it were only deep enough, would go through the earth, and anyone falling into it would fall through into empty space. The sun, when he sets, goes through the sea, and, having gone round underneath us, comes up on the other side. The moon gradually wastes away and dies, and the new moon is a true new moon, and no reappearance of an old worn-out orb that has done previous service. The particles wasted from the old moon are lost, and do not go to build up the new, but how the young moon grows, or from what substance, "men do not know, and the spirits have never told." Eclipses foretell great evils, but it is not known what they are, and nothing can be done to avert them. It is sometimes said that an eclipse is a sign that the world is coming to an end, but this is inconsistent with the universal belief in the stability of the physical universe, and may be an idea which has filtered into the native mind through the influence of European thought in other but allied directions.

Thunder is caused by a very large mythical bird clapping its wings, and lightning is its excrement when purged. When lightning strikes any object, such as a dwelling, cattle-fold, or tree, the bird itself has descended, and again reascends in an invisible mist. Its descent is for the purpose of laying its eggs, and if these are not destroyed by the magicians, they are hatched and breed more thunder birds. The eggs, like the bird, are invisible.

A rainbow in the west indicates that there is to be no more rain for the present—this is simply the general result of observation—if in the east there is to be hail. When an extremity seems to rest on a pool or stream, no one will bathe at the spot, nor are women allowed to fetch water from it while the rainbow is supposed to remain there, which is a varying period. "Should anyone go to the spot they would find there a large basin, and in it an Incanti, which would swallow them in a heap."[1]

Long continued wind is caused by evil people, wizards, and witches. These it is the business of the magicians to discover and expose. Rain is under the control of the professional rain

[1] Sutton.

doctors. When no rain falls after the usual ceremonies, the doctor may accuse anyone of "stopping the rain by raising his posterior to the clouds."

Earthquakes portend frightful wars, in which all known tribes are to be involved. The origin and course of the war cannot be foretold, and nothing can be done to avert the coming calamity. During the present century earthquakes have been almost unknown in South-East Africa, and the accounts of them are almost purely mythical.

Origin of death.—Man came from the never-dying *Sudiwa*, but how, no one can tell, and after he had been a long while in a certain place, the chameleon was sent with a message to say that men were not to die, and immediately left upon its errand. The *Ntulo*—a species of lizard—overheard the instructions given to the chameleon, and resolved to avenge an old grudge by discrediting the rival and favourite that had been entrusted with so important a commission. Being swift of foot, the Ntulo waited till the messenger was well on his way, and then travelling by another route, arrived while the chameleon was still struggling in the marshes. The message he then delivered was that the Sudiwa had said men were to die as all animals die. When the accredited messenger appeared to deliver his commission, he was met with insult and scorn. To him man said:—"Go, false one, we have already heard the words of the great Sudiwa from the Ntulo, and many men have died." Thus was the chameleon disgraced, and the Ntulo made famous.

When men die the body is dissolved and disappears for ever. There is no future or general resurrection possible, and certainly not after the body has become amalgamated with the earth in which it is buried. The dead may, however, be raised after burial by wizards and witches, but such reanimated bodies do not reappear among their former associates, nor do they take any interest in ordinary human affairs. They wander, partially bereft of their senses, in forests and swamps, and inhabit damp and dismal caves. This explains the custom of watching all graves, and why the grave of the chief must be watched and guarded night and day for years.

Miscellaneous customs.—Sneezing is a sign of good luck, prosperity and fortune. Stepping over another is highly improper, and anyone guilty of it will fall in battle should he be called upon to go to war. If a woman steps over her husband's stick he cannot aim or hit anyone with it in a village brawl; it is simply useless for its proper purpose. If she steps over his assegai, it will never kill or even hit an enemy, and it is at once discarded and given to the boys to play and practice with. A woman must enter and leave a *kraal*—the huts and cattle-fold

composing a man's dwelling or steading—by prescribed paths, and must not enter the fold among the cattle, nor in any way interfere with their milking or feeding. Wizards and witches may bewitch from a foot-print, or from the impress of the body in sitting or lying upon the ground. To this there is not much importance attached, but finger nails and hair when cut must be carefully kept and buried.

Should anyone, supposed to be an enemy, be near when a man has occasion to retire, he will travel a long way from his house to some secluded and hidden spot. It is always customary to observe a practice resembling the Levitical enactment respecting the pointed stake.

Uneven numbers are unlucky, and on special missions from a chief odd numbers of councillors are never sent. Evil spirits hover about the unmated member of the party. These take the form of baboons, wild cats or owls, and when any such creatures appear away from their usual haunts, it is a sure sign of evil in the air. Elephants are greatly revered but not sacred. "When a hunter hurls his spear at one he accompanies it with the words 'pardon me'."[1]

If a man is in hiding for a crime he defies detection by chewing the leaves of a plant known locally as the *umfingwane*, and charms carried about by a man stealing, prevents his being caught, even if seen by many persons. Africans never spit in a strange house. The spitter would be accused of bewitching the place. In a man's own house saliva must be carefully swept away or obliterated to prevent wizards getting hold of it to mix with their medicines.

Men and women never mention their own names if anyone else can be got to do it, but they do not absolutely refuse when it cannot be avoided. Wives never mention the names of their husbands, nor daughters and sons-in-law that of their parents-in-law. Children may mention their parents' names. The chief is never spoken of by his name. Either his title or his father's name is invariably used. The chief's name is usually changed on arriving at manhood, and a warrior's name is often changed after doing deeds of valour, and one less or more descriptive of bravery adopted. Names of common objects are changed by tribes and for various reasons. Should a chief's name be the same as a common object the name is changed. "One chief was called *Langa*—the sun—and in that tribe the name of the sun was changed to *Gala*, and so remains to this day, though Langa died more than a hundred years ago."[2]

During war a wife will often take her sleeping mat and place

[1] Brownlee. [2] *Ibid.*

it against the door of her hut. If the shadow shows sharp and clear her husband is alive and well, but if not, "he will never look upon the sun again." A warrior who twists tufts of the hair of the common rat with his own has all the chances of avoiding the enemy's spear that the rat has of avoiding an object hurled at it, and this causes rat hair to be in great demand when war is expected.

At the end of the year all the men of certain tribes procure a strong emetic which they swallow, and cases have been known in which the magicians ordered the men to make a pilgrimage to the sea and swallow quantities of salt water for this purpose. No special reason is given for the custom except that it "clears away all the evil humours of the body." Before the war of 1877, warriors were directed to make a pilgrimage to the sea-side for this purpose in order to make them strong and valorous against the English, who had their strength in war through having come "out of the sea in their ships."

In some cases of illness the relatives, instead of calling a magician, drive all the cattle up to the sick man's door. A relative then in a loud voice shouts to the ancestors to say what is the cause of illness, and indicate a remedy. The first beast that makes water is selected as a sacrifice, but before being slaughtered it is probed sharply with an assegai, and if it bellows it is the right one. A large gash is then made in its side into which a man inserts his hand, and laying hold of the abdominal aorta, tears it away and breaks its walls. Some fat is extracted and burned while the beast is dying. After it is dressed the right front shoulder is detached and taken into the hut, where a portion is broiled on embers and given to the sick man with medicinal ingredients. This remedy is supposed to be most efficacious in many instances.

When twins are born the father plants two euphorbia trees near the door of the hut, but I am unable to say why this is done. An unmarried woman on the seventh day after the commencement of the monthly period takes a handful of ashes from the village heap and eats it. A cow must be milked for her by her brother, and porridge made with the new milk, of which she partakes on the same day that she must eat the ashes. "Chastity in married women can hardly be said to exist among the coast tribes. . . . Still chastity has a value in the estimation of the men, as is proved by the care and jealousy with which the harems of great men are guarded."[1] Adultery in the case of those so guarded is often punished by cutting off the right ear of both parties, while the man may suffer penalty as

[1] Theal.

an eunuch. Mrs. Sutton writing from Bacaland in August last says, "Ten days ago a woman belonging to a closely guarded harem and who had been found guilty of adultery, was put to death and her body left to be devoured by dogs or vultures."

In time of war the body of the first enemy killed is mutilated and a powder made as described in connection with initiatory rites for admission into guilds. This the war doctor rubs into a small incision made in the forehead of each warrior, to infuse strength and courage for the conflict. When peace is proclaimed it is usually ratified by an exchange of large presents of oxen, as many as one hundred being often sent by one chief to another.

As I write, one minor custom after another recurs to my mind, but a great number of these ceremonious usages of daily life are of little significance and of hardly any value except for purposes of comparison, as no reason is ever assigned for them except that most convenient of all reasons, "our people have always done so."

A very curious custom is observed by messengers sent by chiefs when on a long journey. It is customary to honour such by killing a sheep or goat where they halt for the night. The bladders are all given to the messenger, and these on his return he forms into a kind of coronet which he wears for many months. The larger the number of bladders the greater man he is. The head-dress has an unusual appearance, and is suggestive, if not of much feasting, at least of much slaughter. It should have been mentioned elsewhere that women are as often magicians as men.

Before concluding this very partial sketch of African customs, I wish to refer to a few facts not included in Mr. Frazer's questions, and to which I have adhered as closely as I conveniently could. The large field of arts and manufactures has not been touched upon, nor has any reference been made to the monuments left, in place-names and paintings, by the tribes displaced, centuries ago, by an advancing wave of conquest from the north.

Mr. G. M. Theal, in his admirable little book, "Boers and Bantu," says of South Africans generally:—"The most prominent virtue of the Bantu tribes is devotion to their chiefs. Unquestionably this devotion retards their civilization; unquestionably also it has caused enormous loss of blood and money to Europeans and this country; nevertheless, it is a virtue in them. It is the bond that holds society together. . . . Another noticeable feature is their hospitality to equals and superiors. To so great an extent is this carried that food may almost be said to be common property. . . . Anyone passing by at

meal-time, friend or stranger, provided he is not inferior in rank, sits down without invitation or ceremony, and shares in the meal. In most villages there is a hut set apart for the accommodation of strangers." Of this last trait of character I had ample opportunity of forming an opinion during the last three years I spent in Africa. My duties brought me frequently into contact with a large number of chiefs and sub-chiefs, and the nature of my business was not always very agreeable to them, but I was received with unvarying courtesy, and every hospitality was shown. No sooner was my intention to pass the night at a village known than a messenger was dispatched to slaughter a sheep, which, when dressed and cleaned, was presented to me whole. The left shoulder, as the joint of honour, is in such cases invariably returned to the chief. On one occasion I had to visit the chief of the Xezebis. From the Thursday evening till the following Monday morning we waited for the formal reception, but then it was worth waiting for. At the appointed time the old chief, Jojo, appeared with two thousand mounted men to do us honour. Before we separated he had given me land, fully understanding what he was doing, to the value of £1,500 at least, for the use and benefit of the Scottish Mission.

Speaking of another phase of character Mr. Theal says in the book already quoted, "The deceptive power of all these people is something wonderful to Europeans. But there is one member which the coast native cannot control, and while, with a countenance devoid of all expression, he relates the grossest falsehoods, his lively eye betrays the passions he is feeling. Truth is not a virtue that one, who knows what savage life is, would expect to find in a Bantu." Of the truth of the above paragraph I have also had ample means of judging.

All the tribes were, when first encountered by Europeans, acquainted with the use of iron. This they smelted from its native ore, and formed into weapons of war and implements of husbandry. The smith's art was generally hereditary in families, and they displayed considerable skill in certain branches of metal work. All their skill was given to the manufacture and ornamentation of arms, and many of these were as neatly finished as they could have been by an European workman. In the manufacture of articles from wood they had made no progress, and fire was the principal agent used in shaping spoons and knobbed sticks. The construction of any article requiring different pieces of wood jointed together was beyond them. Building with stone was practically unknown except among the mountain tribes, who formed cattle-folds with uneven blocks piled one upon another. The African has added little to the stock of knowledge with which man set out after

the great dispersion on the plain of Shinar. He has wandered hither and thither over the face of the continent, and has been sorely tried in the struggle for existence, but he has never relaxed hold of his stock-in-trade if he has not been able to add to it. To make a fire, smelt iron, whittle a bow and feather an arrow, to char and dig out a tree trunk for a canoe, to make a net for bird, beast, and fish, these seem to sum up his accomplishments, if to them we add one other, the skill to brew. Brew he must, and brew he does, and this it is which cheers his otherwise dull and common-place life. When galled by the fetters of custom and the fear of goblins, ghosts, and evil spirits, he can, sitting beside his chief's beer tub, defy them one and all, and he can even declare his willingness to meet an Incanti in single combat. But his elation and freedom of spirit is, alas! short-lived. On the morrow he must, in sackcloth and ashes, invoke the aid of the magician, and do penance for his too daring departure from custom and his defiance of those whose power over his whole life is infinite.

At one time a great portion of South-east Africa was occupied by Bushmen. They were wandering and homeless savages, but they have left behind them a record of occupation which has hitherto defied the ravages of time. On the rocky sides of their cave dwellings they were in the habit of making rude paintings of men and animals. The pigments used were white, terra-cotta, and dark brown, verging on black. Several of these cave paintings I have seen and examined minutely, and in every case found the colours, when washed and cleaned, as fresh and perfect as when left by the primitive artist. When the late Sir Bartle Frere was Governor at the Cape, he spent a short time as my guest at Blythswood. I mentioned to him the existence of a "Bushman's cave" in the neighbourhood, and we afterwards inspected it together. He was greatly interested in what he saw. Subsequently a well-known American lady artist visited Blythswood, and at my request made careful and accurate copies of all the paintings in the cave. These I sent to Sir Bartle Frere, and he either gifted or lent them to some museum in London, but which I am not certain; South Kensington, I think. I am not aware that any other really able artist has had an opportunity of seeing and copying any of them.

There is a curious theory current among a number of South African tribes regarding their own origin as separate peoples. Universal tradition points to the north as their original home, but how they wandered away from it is seldom explained, and many profess entire ignorance as to the causes which led to a change of country and home. The tradition referred to accounts for the migration as follows:—

The great chief whose people occupied the whole of the centre of Africa, and whose name was Uhlanga, had a law forbidding women to marry before a certain age on pain of direst punishment.

Long ago, "so long that all memory of their exploits is lost," Uhlanga sent a great army, the greatest ever mustered at one time, on an expedition towards the south. This army, which was to be absent a long time, and was to conquer all peoples to the farthest sea, was accompanied by numbers of young women as cooks. After an absence of three years, during which the army met and destroyed a very great number of tribes, the waves of the sea stopped its advance. The soldiers then gave themselves up to rest and enjoyment, and only after they had grown fat eating captured cattle, did they think of their homes and their children. After the march northwards was continued many days, it was found that all the girl cooks were *enceinte.*

This caused consternation and terror among all ranks, and, for fear of punishment and death, the whole army retraced its steps towards the south, and arrived in the country of the Bushmen. There the generals divided the companies between them, and settled down to the pursuit of agriculture. They never had any tidings of their wives and children, nor did any of them return to their old home. Uhlanga thought that his army had perished, and never again sent an expedition to that country.

The resemblance of this tradition to the well-known classical story is so close as to make one at first doubt its originality, but it is found among those peoples who have had least contact with Europeans, from whom alone they could learn the legends of the days when Rome was young.

When questioned regarding distances, and the time it would take to travel "to their home," in connection with such traditions as the above, the African's ideas are altogether hazy. He has no conception of the extent of his own continent. He understands nothing of lands beyond the sea, and all questions regarding navigation resolve themselves into magic and dark arts known only to white men.

Turning from tradition and legend to the daily life of the African, we find that the apparently easy and aimless life of the village is one of elaborate ritual and rigid adherence to forms, and this enters into all relations of life, public and private.

When special fire is used, either in connection with sacrifice or the festival of first-fruits, it must be produced by a doctor and in the following manner:—Two sticks made of the *Uzwati* tree, and called the "husband and wife," are given to him by the chief. These sticks are prepared by the magicians, and are

the exclusive property of the chief, the "wife" being the shorter of the two. The doctor cuts a piece off each stick, and proceeds to kindle fire by friction in the usual manner. After he has obtained fire, he hands it to his attendant, who gets everything ready for setting on the pot. The sticks are handed back to the chief by the doctor—no other hand must touch them—and put away till again required for a similar purpose. They are regarded as sacred, and no one, except the chief's personal servant, may go to the side of the hut where they are kept. A special pot is used for the preparation of the feast, and no other than it may be set on a fire produced from the "husband and wife." When the feast or sacrifice is over, the fire is carefully extinguished, and the pot placed along with the sticks, where it remains untouched till sacred fire is again kindled. This custom is not now universal; it probably was so at one time.

It is highly improper to kindle a fire in certain circumstances. There is a legend that when Unsha arrived in what is now Natal, having been preceded by a division of his army under his eldest son, he saw smoke rising as from a newly-kindled fire. He sent to enquire whose doing it was, and, being told his son had kindled it, he sent for him and addressed him thus:—"From this day you are no longer heir to the chieftainship of my people. Your first act on entering the enemy's country was to make a fire. That shows you will destroy my people." His second son was appointed heir, and he, in turn, offended his father by giving an order, the result of a foolish whim, that the first milk from every cow that calved was to be brought to him. The verdict in his case was:—"You rob the calves. When you are old you will suck blood." The third son was appointed heir, and became his father's successor.

When a man has been slain in war, the doctor visits the village and prepares medicine, which he mixes with fat and small chips of an exceedingly bitter tree—sneezewood. This he sets on fire in his hands, and blows the smoke over the relatives and assembled friends. The smoke drives away the assegai from them, and no further calamity happens.

When a married woman dies the husband eats bitter herbs, and goes out for several days tending the cattle, returning home after dark. When a husband dies, the widow goes away from home, and remains on the open plain or mountain for ten days, irrespective of the condition of the weather. If he falls in battle, she secludes herself ten days in her hut.

Among certain of the mountain tribes there is a curious custom regarding an enemy who falls after displaying conspicuous bravery. They immediately cut out his heart and eat it. This is supposed to give them his courage and strength in

battle. The man who slays such an enemy is, at the close of the war, called before his chief, and gets from the tribal doctor a medicine which he chews with his food. The third day after this he must wash his body in running water, and, at the expiry of ten days, may return to his wives and children.

Women are at times forbidden to eat flesh from the foreleg of any animal. Ox tongue is at all times forbidden to women. A newly-made bride may not eat the flesh of bulls, nor may she eat flesh from the ribs of any animal. During menstruation women may not taste milk; if they did the cattle would die. The lungs, neck, and breast parts are eaten by boys only, while men are forbidden certain portions of the entrails. The head of the household never quite finishes what he has on his plate, and the eldest son is the only one who is allowed to take what is left and lick the plate.

At public entertainments, if a man of inferior rank is appointed by the host to wait upon guests of tribal standing, they will not accept food at his hands. The usual custom at large gatherings is to appoint one from among the guests to act as master of ceremonies, as regards his tribesmen. I once got into a curious difficulty through neglect of the correct etiquette. At a church opening at Somerville, about one thousand persons were present, representing six or eight distinct tribes. A man was appointed to wait upon a party of Pondomise, whom they regarded as not only of inferior rank, but an upstart from another tribe who wished to be recognized as a subordinate chief. Not a man would taste the food provided, and only after profuse apologies and explanations, tendered in the most public manner, could their wrath be appeased. The error was excused on the ground of my "ignorance of custom," and after that, good fat beef did the rest, and all dispersed in great good humour.

There is among the Bacas a curious custom in connection with courtship and marriage. A young man first tells some of his friends that he admires a certain girl, and after a stated period he speaks to her and says he would like to *Twala, i.e.*, carry her off. If she is agreeable to this *twala* she mentions a day, and he then carries her off by stealth to his parents' village. Whether his parents like it or not they cannot possibly, under the sanction of custom, refuse to receive her, and she remains at their village for three days under their care and guardianship.

On the third day she is returned to her father's house with the dowry cattle. If he accepts the cattle, the marriage is arranged to take place at an early date, and her lover does not see her again till the ceremonies are over. Should the girl's

father refuse the cattle and return them, the affair takes end. The young people are not in any way consulted regarding their feelings in the matter, nor does it ever occur to an African that this should be done under any circumstances.

The men of the Pondomise tribe have an extraordinary method of dressing their hair. The framework of the head dress is formed by placing a small ring of grass on the crown of the head. The hair is then well rubbed into the grass with fat, and securely sewn with thread made from the sinews of an ox. It is then greased and dressed every day, and the circlet rises with the growth of the hair till it attains an elevation of several inches above the head. It is never removed till colonies are formed under its dense mass, and when these become numerous, the man whose head gear was the pride of his life, appears with clean-shaven pate.

To the European who studies native manners, nothing is more marvellous than the force of custom and the power exercised by magicians. Their predictions may fail, thieves may go unpunished, rain may not fall, patients may die, but the magicians remain a sacred order, and every failure is explained away, and the fetters of custom remain unbroken. There are a few shrewd men who value the whole genus of magicians at their true worth, and who, from motives of policy rather than faith, observe the ancient customs. Such was my old neighbour, the Gcaleka chief, Segidi. A conservative beyond most in all matters of traditional usages, he was fully alive to more modern methods of conducting his business. While his war doctor was in a trance waiting for communications from the spirit world regarding the success of an expedition, Segidi's spies travelled the whole length of the enemy's country and brought him back an accurate report of the probable strength of the opposing force and their tactics in the field. Again, while liberally rewarding his tribal priests for warding off evil and upholding the traditions, he came to me with three of his sons to send them to school at Blythswood, where they remained for years, to return carrying with them that which never can be assimilated with the old life, be they professed Christians or heathens.

Native Africans have great attachment to their children, and bestow much care on their training. The heir of the house is his father's constant companion. From earliest years he is instructed in all the traditions of his family, and the history of his tribe. He is educated in the theory and practice of law, and learns to recite songs commemorative of deeds of valour. Hatred of traditional enemies is instilled into his mind from the first dawn of intelligence, and he grows up with all the feelings

of rancour cherished by those who were first wronged by the people he is taught to hate. Duplicity, falsehood, and cunning are among the virtues instilled into his mind by those who have charge of his education.

Even in his sleep the African must observe the customs. A man must never sleep on the right hand side of the bed when he occupies the same bed with one of his wives. He must not touch her with his right hand; if he did he would have no strength in war, and would surely be slain.

The newly-arrived traveller gets a bit of fat with which to anoint his weary limbs. He sits in a particular place at meals, and has a servant set apart to wait upon him. If a man of note, a sheep or ox is killed in his honour, and the whole carcass presented to him. He returns the left foreleg to the chief or head man, and the remainder he keeps for himself and his attendants. All the years I spent in Africa, I never slept at a chief's village without having a whole sheep presented to me. I have, however, in turn presented a good many to distinguished visitors at the Mission.

It is difficult to exhaust the customs and small ceremonial usages of a savage people. Custom regulates the whole of a man's actions—his bathing, washing, cutting his hair, eating, drinking, and fasting. From his cradle to his grave he is the slave of ancient usage. In his life there is nothing free, nothing original, nothing spontaneous, no progress towards a higher and better life, and no attempt to improve his condition, mentally, morally, or spiritually.

These papers have already exceeded their intended limit and all reference to social gatherings must be omitted, and so must also the customs in building houses, irrigating land, breaking up new ground for cultivation, marking and ornamenting cattle, the reception of strangers and foreigners, the currency before the introduction of beads, buttons, brass wire, and finally coins, the daily routine of village life, regulations for keeping the peace among a multiplicity of wives; these and many other facts are all worthy of study by the anthropologist and historian, as are also such customs as forbid cutting timber while the crops are green, now a religious observance, probably originally a wise forest law in regions where it was difficult to procure timber. Over these things I seem to linger. They belong to the past in my own life, and looking at them now, in view of all the disintegrating forces at work, one feels that they are rapidly becoming a shadowy memory in regions where once they were regarded with an awe and veneration, which gave them the dignity of a national religion as well as an ancient and time-honoured philosophy.

MARCH 25th, 1890.

HYDE CLARKE, Esq., *Vice-President, in the Chair.*

The Minutes of the last meeting were read and signed.

The election of the following gentlemen was announced:—

Professor JOHN CURNOW, M.D., of 3, George Street, Hanover Square, W.

Dr. WILBERFORCE SMITH, of 14, Stratford Place, W.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the AUTHOR.—Essays of an Americanist. By Daniel G. Brinton, A.M., M.D.

—— Note sur l'homicide par flagellation. Par le Dr. Barret.

—— Note sur une statue ancienne du dieu Çiva, provenant des ruines de Kampheng-Phet, Siam. Par le Dr. E.-T. Hamy.

—— Alexander Brunias. Courte Notice sur son œuvre. Par le Dr. E.-T. Hamy.

From the SMITHSONIAN INSTITUTION.—Proceedings of the United States National Museum. Vols. x, xi.

—— Bulletin of the United States National Museum. Nos. 33–37.

From the GEOLOGICAL AND NATURAL HISTORY SURVEY OF CANADA.—Annual Report. (New Series.) Vol. iii, Parts 1, 2.

From the Right Hon. the SECRETARY OF STATE FOR THE COLONIES.—Statistics of the Colony of New Zealand for the year 1888.

From the ACADEMY.—Bulletin International de l'Académie des Sciences de Cracovie. 1890. No. 2.

From the INSTITUTE.—Annual Report of the Canadian Institute, Session 1888–9.

From the SOCIEDADE CARLOS RIBEIRO.—Revista de Sciencias Naturaes e Sociaes. Vol. i. No. 3.

From the SOCIETY.—Journal of the Society of Arts. Nos. 1947–1948.

—— Proceedings of the Literary and Philosophical Society of Liverpool. Vols. xli–xliii.

—— Arhiva Societăţiĭ Ştiinţifice şi Literare din Jaşĭ. 1890 No. 4.

From the EDITOR.—Nature, Nos. 1063, 1064.

—— Science. Nos. 370–371.

—— Revue Scientifique. Tom. xlv. Nos. 11, 12.

The following Paper was read by the Author:—

The OLD BRITISH "PIBCORN" *or* "HORNPIPE" *and its affinities.*

By HENRY BALFOUR, Esq., M.A., F.Z.S.

[WITH PLATES II AND III.]

THE primitive wind instrument known by the name of "Pibcorn, Pibgorn, or Piccorn," now obsolete, has been but rarely described, and still more rarely figured, as specimens of it are now extremely scarce. There is evidence of its considerable antiquity in Great Britain, and most authorities regard it as of purely indigenous origin. Sir John Hawkins[1] says that the "Hornpipe" was invented in this country, and Fetis[2] mentions Angelsea as its place of origin. A comparison, however, of this interesting instrument with others of a similar primitive nature, seems to afford considerable evidence that its presence in great Britain was due to its transmission westwards over Europe from the East.

The Pibcorn is identical with the "Hornpipe" of some authors, the dance known by the latter name being, without doubt, derived from the instrument which was formerly usually employed in its accompaniment. An analogous case of the name of a dance being derived from a musical instrument occurs in the word "jig," derived through the French "gigue" from the German "geige," a fiddle.[3]

Somewhat similarly the term "Musette," originally meaning a "little pipe" or small Cornemuse of special form, came by an ordinary ellipsis of language to be applied to a piece of music written in the style of bagpipe music.[4]

The Pibcorn is by some writers called "Cornpipe," or "Cornepipe," but all these are merely varieties of the same word; *pib*, in Welsh; *piob*, Gaelic; *pipa*, Swedish; *pipeau*, French; *pfeife*, German; and *pipe* in English, being all modifications of the same; and similarly *corn* is allied to *κέρας*, cornu, and corne, and refers to the use of *horn* for some part at least of the instrument.[5]

[1] "History of Music," 1776.

[2] "Histoire générale de la Musique," 1874, vol. iv, p. 280.

[3] *c.f.*, "King Horn," a Romance, ed. by J. R. Lumley, Early Eng. text Soc., 1866, line 1465—

> "Rymenhild hit gan ihere
> And axede what hi were:
> Hi said hi weren harpurs,
> And sum were *gigours*."

[4] Stainer, "Music of the Bible," p. 119.

[5] Stainer, "Dictionary of Musical Terms."

There are various mentions of the Hornpipe by the older writers.

Spenser[1] gives us the following passage—

> "Before them yode a lustie tabrere,
> That to the many a horn-pype playd,
> Whereto they dauncen eche one with his mayd.
> To see those folks make such jovysaunce,
> Made my heart after the pype to daunce."

Ben Jonson, in the "Sad Shepherd,"[2] too—

> ". . . , to awake
> The nimble horn-pipe, and the timburine."

And earlier still, Chaucer in his translation, the "Romaunt of the Rose"—[3]

> ". . . Yit wolde he lye
> Discordaunt ever fro armonye,
> And distoned from melodie,
> Controve he wolde, and foule fayle,
> With hornepipes of Cornewaile."

Some writers assert that Chaucer wrote *Corn*-pipes as his translation of the "Chalemeaux" or "estives" of the original (written in the year 1260), but Sir John Stainer[4] points out that probably "Chalemeaux," like the Latin form *calamus*, means a reed, and does not here refer to cornstalks.

It is true that pipes made of cornstalks are mentioned very frequently, and appear to have been used very largely by pastoral people. Such primitive instruments may doubtless be considered as the origin of all pipes with beating reeds, and to have suggested the higher forms, of which the pibcorn, and many other instruments to which I shall presently refer, are examples.

A rough and primitive pipe made of a small reed or green cornstalk, closed by a node at the upper end, and with a small strip slit off, but remaining attached by one end to form a vibrating tongue, is one of the simplest, and probably one of the earliest invented of wind instruments. To this class of simple pastoral instruments we must probably refer the origin of all instruments of the clarinet order, with single or beating reeds.

In like manner the oboe, shawm, or waits, should be referred to a similar simple instrument of reed or cornstalk, in which the mouth end is not slit to a vibrating tongue, but *pinched* together, thus forming a rough "double reed," on the oboe principle.[5]

[1] "Shepheard's Calender," May, line 22.
[2] P. 259, of Gifford's edition, 1816.
[3] Al line edition, lines 4246–4250.
[4] "Dictionary of Musical Terms," p. 228.
[5] E. Naumann ("History of Music") says that the "Schallmey" is derived from

Virgil[1] speaks of the use of a simple corn pipe--

"Tityre, tu patulae recubans sub tegmine fagi
Silvestrem tenui musam meditaris avena."

So Chaucer[2] also—

"And many a pipe and liltyng horne,
And pipes made of grenè corne
As have these little Herdegroomes
That kepin beastes in the broomes."

Spenser[3] mentions oaten pipes many times--

"I sawe Calliope with Muses moe,
Soone as thy oaten pype began to sounde,
Their ivory lutes and tamburins forgoe."

and[4]

"Rude ditties, tunde to shepheardes oaten reede."

Shakespeare has this line—

"And shepherds pipe on oaten straws."

When a larger reed is substituted for the slender cornstalk a superior instrument can be made; with a removable mouthpiece, cut from a smaller reed, slit to form a vibrating tongue of the simplest kind as before, and with finger holes more or less carefully tuned to a scale. In this stage there are several modern representatives, as, for example, the "*Arghool*," and "*Zummarah*" of the Arabs in Egypt, which have double pipes, while others consist of a single pipe only.

The instruments of the "Hornpipe" class are but slight improvements upon this simple and early form. In his work upon the "Musical Instruments in the South Kensington Museum,"[5] Carl Engel figures a Welsh "Pibcorn," lent to the Museum by C. Wynne Finch, Esq., said to be of the early eighteenth century. It is described as made of horn, measuring about 18 inches in length, and having seven finger holes (only six appear in the figure, so probably the seventh is a thumb hole placed at the back). At one end is an expanding and slightly curved bell-mouth of horn, the outer edge of which is *serrated;* at the

the calamus (Roman reed pipe). "It is found in its most primitive form amongst the peasants of the lower Rhine, where it is known as the May flute. It is made by youths in the spring, of green reeds or the soft bark of trees, and possesses a soft dreamy tone, not unlike the schallmey register of the clarinet."

[1] Eclogue I, lines 1 and 2.

[2] "House of Fame," Book III, lines 133–136.

[3] "Shepheard's Calender," June. line 57.

[4] *Ibid.*, December, 14, 5; also January, 72; February, 40; October, 8, 56, 118; November, 24. 71; December, 142; also "Colin Clout's come home again," lines 5, 13, 360, and "Astrophel," 1, 44, &c.

[5] 1874, p. 293.

other end is a wide mouthpiece or air chamber, also of horn, which conceals and protects the delicate reed. This reed is described as resembling that of the *hautboy*. Stainer,[1] too, describes the hornpipe as an instrument "of the *shawm* or *waits* character," that is, having an oboe reed. This form is probably a comparatively late variety of the instrument.

Another specimen of the Pibcorn from Angelsea, and, as I believe, one of an earlier type, is figured and described by the Hon. Daines Barrington in the "Archeologia" for 1779. I give reduced copies of his figures (Figs. 7, 8, 9, Pl. II). This instrument in general character very closely resembles that figured by Engel; the pipe is proportionately longer and narrower, and is of *reed*, with six finger holes in front and a small thumb hole at the back. The bell-mouth of horn is exactly similar to that in Mr. Wynne Finch's example, even to the serrated edge, and the mouth-piece of horn bears the same resemblance to its fellow in the other.

The chief difference between the two specimens is seen in the reed, which is not on the oboe principle, but on the *clarinet* principle. It is a "beating" reed, formed by slitting the small reed-piece from above downwards, leaving the lower end of the vibrating tongue, thus formed, fixed, after the fashion of the cornstalk or Arab reed pipes, mentioned above. I think that this is the original form of the reed of this instrument for reasons which I shall presently explain.

With regard to the distribution of this instrument; it was, no doubt, at one time widely distributed, but we have mention of it only as occurring in Wales, Cornwall, Lancashire, South Scotland, Ireland, and also in Brittany. It was especially favoured by the rustics in the Island of Angelsea—Daines Barrington having obtained his specimen thence, where he heard the instrument played upon. He mentions that it was then scarcely used in any other part of North Wales except the Island of Angelsea, where Mr. Wynn, of Penhescedd, gave an annual prize for the best performer. He adds, "The tone, considering the materials of which the Pibcorn is composed, is really tolerable, and resembles an indifferent hautboy."

Edward Jones[2] mentions a Welsh instrument of allied form: "a sort of pipe used in some parts of South Wales, called *cornicyll* (from *cornig*, a diminutive of corn), which has a concealed reed on the same principle as the *pibgorn*, and the mouth-piece screws off in order to introduce the reed; in other respects this instrument is made like a common clarinet." This

[1] "Dictionary of Musical Terms," art. "Hornpipe."
[2] "Musical and Poetical Relicks of the Welsh Bards," 1794, quoted by Engel.

probably closely resembled Daines Barrington's pibcorn, with its "clarinet" reed.

I have not succeeded in finding any original mention of the occurrence of the hornpipe in Cornwall, though Sir John Stainer[1] quotes this locality in his list. Some writers assert that the word cornpipe is equivalent to "Cornwall" pipe, but this appears highly improbable. It has occurred to me that possibly Chaucer is responsible for the introduction of Cornwall into lists of localities in which the pibcorn has occurred. In the passage from the "Romaunt of the Rose," quoted above, the word "Cornewaile" appears as his version of "Cornouaille," as it is in the French original. Without reference to the original it might well be supposed that Chaucer referred to Cornwall, whereas the original, *Cornouaille*, no doubt refers to the district in the south-west of Brittany of that name. Sir John Stainer, to whom I mentioned this point, kindly tells me that he quite concurs with this opinion. In spite of this, on the other hand, Cornwall is a district to which one would turn in seeking for instances of the survival of a Keltic instrument, and it is a matter for surprise that there should be no recorded instance.

The "Lancashire Hornpipe" is mentioned in *The Tatler* (No. 157, April 11th, 1710), but I have been able to find no description of this form, and cannot say whether it differed from the Welsh.

It is represented in Scotland by the "Stock-horn." In Jamieson's "Scottish Dictionary" the "*Stock-and-horn*" is described as a "musical instrument composed of the *stock*, which is the hind thigh bone of a sheep, or a piece of elder, with stops in the middle, the *horn*, the smaller end of a cow's horn, and an oaten reed."

In the splendid volume on "Musical Instruments," by Hipkins and Gibb, it is said that the Lowland Scotch shepherd's pipe is made of horn, the cover for the reed being also of horn.

Engel[2] writes, "The *stockhorn*, which the pastoral people in Scotland formerly constructed, is similar to the Welsh *pibgorn*. In the 'Complaynt of Scotland,' which was written in the year 1548, we find the *cornepipe* enumerated among the pastoral instruments played by eight shepherds: 'The fyrst had ane drone bagpipe, the nyxt hed ane pipe maid of ane bleddir and of ane reid, the third playit on ane trump, the feyerd on ane corne pipe, the fyfth playt on ane pipe made of ane gait horne, the sext playt on ane recordar, the sevint plait on ane fiddil, and the last plait on ane quhissel.'"

Again (on page 373), Engel mentions a specimen of the

[1] *Op. cit.*
[2] "Musical Instruments in South Kensington Museum," p. 293.

Stockhorn lent by Mr. J. Gordon Smith, and quotes the following passage from Allan Ramsey in "The Gentle Shepherd," published in the year 1725 —

> "When I begin to tune my stock and horn,
> Wi' a' her face she shaws a cauldrife scorn . . .
> . . . . Flocks, wander where ye like, I dinna care,
> I'll break my reed, and never whistle mair!"

The various forms mentioned appear to be the principal varieties of the "hornpipe," which have lasted on in the face of competition from superior instruments, practically till the present time. The instruments of this class are closely allied to the bagpipes, as is especially evidenced in the more primitive varieties of the latter instrument, such as may still be met with in the East and also in the more remote regions of Europe. In dealing therefore with the pibcorn class frequent mention must necessarily be made of the bagpipes.

It seems very probable that the use of a large mouth-piece, or "wind-chamber" so to speak, covering the reeds and protecting them from injury, indicated the transition from pipes with uncovered reeds to those which are sounded through, and partly by means of a flexible bag, the skin being substituted for the gourd or horn when a continuous blast was deemed advantageous. A continuous blast can with practice be given, in performing upon some instruments, by inhaling with the nostrils and blowing with the mouth into the instrument simultaneously, after the manner of using the chemist's blow-pipe.

The Bhotanese are described by Turner[1] as being able to sustain prolonged blasts upon the hautboy in this manner; so, too, the Brahmins of India in performing upon their buccinum shells in their religious ceremonies; but this laborious method has been generally rendered unnecessary by the use of the skin air-reservoir of the bagpipes. The gourd or horn mouth-piece covering the reeds may have been originally adopted primarily as a *protection* to the delicate reeds, as we use a cap for covering the vibrating reed of the clarinets, and a secondary use may have been found in perforating the cover, so that this could be used as a mouth-piece, and the reed sounded without being taken between the lips.

The use of a gourd as a combined mouth-piece and reed-protector is very common in Southern Asia and Eastern Europe, and in some districts the same instrument may be met with in two forms, differing only in being furnished in the one case with a gourd mouth-piece, and in the other case with a flexible

[1] "Embassy to Tibet," 1733, p. 127.

skin bag, the remainder being exactly similar, as will be seen from some of the following descriptions:—

If we look to the East the number of reed instruments on the primitive oboe and clarinet types is very considerable, and it is unlikely that instruments whose chief parts are derived from reeds (*calamus*) should have been invented in any country other than one in which these materials occur in abundance; and I will now pass on and describe some Eastern forms which if not identical with our British pibcorn, at least resemble it in such detail as to leave little doubt of the derivation of this instrument from the East. I have already mentioned the Arab reed pipes, *arghool* and *zummarah*[1] (the latter being figured at Fig. 10, Pl. III), as being examples of extremely primitive clarinet forms roughly made from reeds, with small inserted reed mouth-pieces, each slit to a vibrating tongue. In some, the tongue is formed by a slit from below upwards; in others, from above downwards, so that the free end of the tongue points towards the player, as is the case in the pibcorn mentioned by Daines Barrington (*v.* Fig. 9). Occasionally a *tin* bell-mouth is added to these instruments, when a single pipe is used, instead of the double pipes, though the *horn* bell-mouth appears to occur now-a-days only in the bagpipes form mentioned below. A gourd mouth-piece moreover does not seem to be used with these Arab pipes. These appear to be survivals from an earlier stage than that of which the pibcorn is a representative.

Turning to the Greek Archipelago we find there an instrument which in appearance and character is almost the counterpart of the Welsh pibcorn. Amongst several very interesting specimens from the Grecian Archipelago, recently presented to the museum at Oxford by J. Theodore Bent, Esq., were two musical instruments which seem to throw great light upon the true origin of the pibcorn, and the arrival, in fact, of these specimens, led me to write this paper.

The first of these (Figs. 1–4, Pl. II) consists essentially of a chanter composed of two reed pipes of equal length, each furnished with five finger holes, the two pipes being tuned approximately to unison. These are fixed in a channel formed of the half of a section of larger reed split longitudinally. The upper ends of the pipes are fixed into a solid cap perforated with two holes corresponding with the cavities of the pipes. Into these holes above are fitted the two sounding reeds, protected by a short channel of large reed, which faces the opposite way to the channel in which lie the two pipes (Fig. 3).

The two sounding reeds are slit from below upwards to form

[1] Lane's "Modern Egyptians," 1860, p. 367.

vibrating tongues on the simplest "clarinet" principle (Fig. 4), each having a fine thread tied round it in order to restrict the play of the tongue. Over the upper part of the instrument and concealing the sounding reeds, is fitted a small gourd, which is perforated at the top to admit air, and so serve as a mouth-piece (Figs. 1 and 2), forming an air chamber of moderate size. At the opposite end of the chanter is fitted a bell-mouth, made from the small end of a cow's horn, the outer edge of which is serrated. This instrument was obtained in the island of Tenos. Its resemblance to the pibcorn is very striking, especially to the variety described by Daines Barrington (Fig. 7), which I consider the early form of this instrument. In both these the chanter is of reed; the sounding reed is of the simplest kind, and on the clarinet or single reed principle, protected by an air chamber; the bell-mouth is identical in the two forms, made of cow's horn with the outer edge serrated. The chief differences are: the single pipe of the pibcorn and the double pipes of the other; the different number of finger holes; the substitution in the pibcorn of the horn mouth-piece instead of the gourd. In Mr. Wynne Finch's pibcorn[1] further differences occur in the "oboe" reed and the chanter made of horn, differences which were no doubt adopted as improvements upon the older form.

These differences, however, do not amount to much, as they are rather what one would expect to find, as resulting from the migration northwards. The use of *double* pipes, as in the Tenos form, implies the pre-existence of a *single* piped form, of which, no doubt, the pibcorn is a survival, just as we find the single piped form (Fig. 11) of Arab reed pipes existing in Egypt side by side with the double pipes (Fig. 10, Pl. III).

The substitution of horn for gourd in a country where gourds are uncommon is but natural, the substitute most readily suggesting itself being the re-duplication of the bell-mouth of horn at the opposite end of the instrument. The serrated edge of the horn bell-mouth is the less likely to have been independently invented in the two regions from the fact of its not, apparently, serving any *useful* purpose. This, too, may perhaps be said of the bell-mouth itself, which, from the rough manner in which it is fitted, can have but very slight effect in increasing the power of the instrument.

The second specimen from the Greek Archipelago, which bears upon the subject of this paper, is figured at Fig. 5. This specimen illustrates how the Greek "hornpipe" is converted into a "bagpipes" by the mere substitution of the skin of a kid for the gourd mouth-piece. The vibrating reeds are concealed

[1] Engel, "Musical Instruments in the South Kensington Museum," p. 293.

by this skin bag, which is inflated through a small wooden mouth-piece. There are two reed pipes as in the last specimen, but while one has the usual five finger holes, the other, the drone, is perforated by but a single hole. The horn bell-mouth with serrated edge is similar to the other specimen. The tongues of the sounding reeds are slit from above downwards, as in the Barrington pibcorn.

This form of bagpipes is closely allied to the Arabian *zouggárah*,[1] which is, so to speak, the bagpipe version of the common Arab reed pipes, *zummárah*, mentioned above. This consists of two reed pipes[2] tuned to unison, each with four finger holes; *each* pipe terminates in a curved bell-mouth of horn.[3] The reeds are sounded through a goat-skin bag or reservoir, with a simple wood mouth-piece.

Further Eastwards, in Persia, is a kind of bagpipes, *nei ambanah*,[4] which bears a close resemblance to the form just described from the Greek Archipelago. In this there are two reed pipes lying parallel in a split bamboo, each having six finger holes, and a reservoir of sheepskin inflated through a wooden mouth-piece. The vibrating reeds are protected by a projecting semi-cylindrical piece of bamboo, facing backwards, exactly as in the Greek Island specimens. The chanter has no bell-mouth of horn in the specimen described and figured by Ouseley,[5] and this constitutes the only important difference between this and the Greek and Arab forms.

In India the variety of instruments belonging to this simple class is very great. The *toomeri* or *tubri*, and the *poongi* or *pugi*, are primitive forms and probably very ancient ones. Both are especially used by the Sampuris or snake-charmers of Hindustan. The *magoodi* and *papanasem* are other slight varieties, but the proper nomenclature of these instruments is somewhat uncertain at present. The *poongi* has the ancient name of *Nasa-jantra*,[6] and appears to have been blown in ancient times by the nostrils. It—in its modern form—consists of single or double reed tubes, with eight finger holes; the vibrating reeds are of the usual type, and sounded through a covering mouth-piece made, in one variety, of a dried pumpkin (*Curcubita lagenaria*),

[1] Stainer, "Music of the Bible," p. 119.

[2] Metal pipes are sometimes substituted.

[3] From this it would seem that the horn bell-mouth was applied to the *single* pipe originally, and that the pibcorn therefore is probably the representative of the earlier stage before the *double* "hornpipes," such as the Greek specimen.

[4] Ouseley "Travels in the East," vol. i, Pl. XXIII, Figs. 9, 10, 11, and p. 242. *Nei* = reed, pipe, etc., and *ambánah* = bag made of an entire sheepskin. Also called *nei meshek* or *nei kheig*.

[5] *Op. cit.*, i, Pl. XXIII.

Tagore, "Short Notices of Hindu Musical Instruments," Calcutta, 1877.

and in another of leather,[1] thus illustrating well the transition to the bagpipes.

The *toomeri*, said to be more common in the Deckan than in Bengal, is very similar to the above. The number of finger holes varies, there being sometimes the same number on both pipes or several (usually seven) on the chanting pipe, and only three or four on the drone. An instrument of this class is shown at Fig. 12, having two reed pipes, each with four finger holes, and fitted to a gourd wind-chamber with wax fixing. The sounding reeds resemble those of the Greek bagpipes, Arab pipes, &c., and the pipes with their reeds, when the gourd is removed (Fig. 13), bear a striking resemblance to the zummarah of Egypt (Fig. 10), the latter, however, being bound together with twine, while wax is employed for this purpose in the Hindoo instrument.

Another Hindoo instrument is figured at Fig. 14 (Pl. III). Here, again, we have the two pipes, fitted with wax into a very large gourd reservoir, having a peculiar forward spur continued beyond the mouth-piece. The pipes are short and thick (Fig. 15), the chanter having five finger holes, the drone only three. The sounding reeds are precisely as in the last specimen. The resemblance to the Greek "hornpipe" (Figs. 1, 2, Pl. II) in this specimen is greatly increased by the presence of a curved bell-mouth of cow's horn, the method of fixing being precisely the same in the two specimens.

In most of these Hindoo double pipes one pipe is used as a drone, and usually some of the holes in this are temporarily stopped with wax, as may be seen in Fig. 15, according to the drone note required, occasioning a momentary pause in the tune. In the Arab *arghool* the alteration in the drone note is effected by having this pipe composed of a number of detachable joints. Probably in most primitive double pipes, particularly those in which the chanter has more than four finger holes, some such method as that of the Hindoos of stopping the holes of the drone, is used, as both hands must be used in order to cover more than four holes upon the chanter. Bagpipes of the primitive form are to be met with in India, as for example the *tourti* or *tourri*.[2]

It is unnecessary to multiply instances and describe the numerous other varieties belonging to this class; the types I have mentioned are sufficient for my purpose. The object of this paper has been to prove the improbability of the Pibcorn being a strictly indigenous instrument in Great Britain, and the great probability of its having, like so many instruments which

[1] Herklot, "Customs of the Mussulmans."
[2] Stainer, "Music of the Bible," p. 120.

have been brought to perfection in Western Europe, been derived from the East, where we may see varieties of this simple instrument still surviving and in common use.

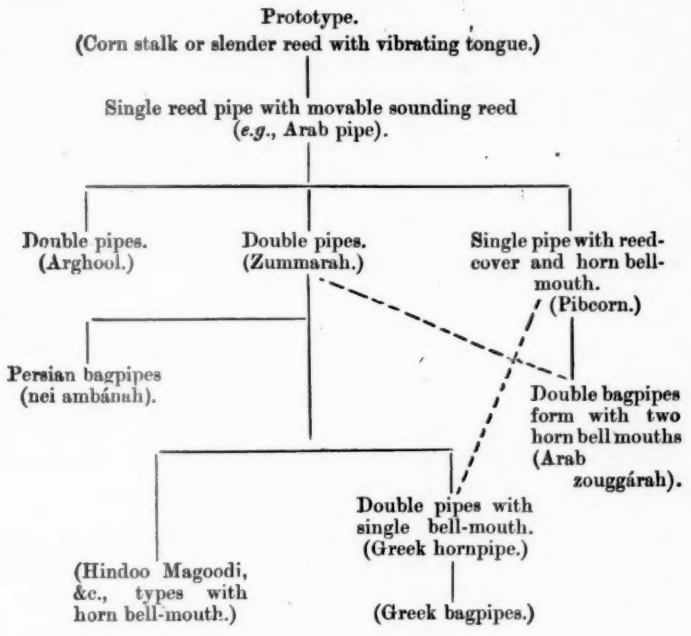
I will very briefly recall the main points of my paper. The Pibcorn and other closely allied British instruments, belong to a large family of reed pipes, whose natural and original home is in the East, and whose sounding reeds are of the simplest kind, and, at least in the early forms, on the "clarinet" principle.

Very early stages in the development of this class still survive, as, *e.g.*, the Arab, single and double pipes of the *zummárah* and *arghool* type, the single form being necessarily the earlier of the two kinds. As a protection to the delicate reeds a cap or cover was added, and by perforating this a secondary use was found for it as a mouth-piece, through which the reeds could be sounded. The curved horn bell-mouth, though not universal, occurs certainly in India, Arabia, and the Greek Archipelago; and in the latter locality the outer edge of the horn is serrated, a character which persists in the Pibcorn.

This horn bell-mouth was added first to the single reed pipe, and the Pibcorn is a representative of this stage, while the Arab *zouggárah* represents the early combination of two pipes of this character, each retaining its bell-mouth, whereas the Greek and Hindoo "hornpipes" illustrate the later stage with a single bell-mouth for both pipes. The bagpipes are closely related to the "hornpipes," the gourd mouth-piece having been replaced by a skin bag, for sustained blasts; they likewise originated in the East, and were derived from the double reed pipes with simple clarinet reeds, the substitution of oboe reeds in the higher forms[1] being a modern improvement, paralleled by the Pibcorn described and figured by Engel. Both hornpipes and bagpipes had formerly a far more general distribution in Europe, the result of a gradual migration westwards, but were gradually ousted by the rapid improvement in musical instruments in Western Europe, surviving only in the more remote regions, among pastoral people, as, for example, in Brittany the *Pibcorn* (?) and Bignou or *Cornemuse* (bagpipes, lit., horn-pipe), in Wales the *Pibcorn* and *Pibau* (bagpipes); in Scotland the *Stock-horn* and Scotch bagpipes. It would seem as though these instruments had been brought to the British Islands with the Celtic immigration, and that they have survived particularly in those regions in which the Celtic blood has held its own. The bagpipes have tended generally to survive the horn pipes as offering special advantages in the sustained blast.

[1] The *drones* of the Highland bagpipes retain the primitive "clarinet" reed, though now-a-days the chanter usually has an "oboe" reed.

A rough scheme may help to illustrate the affinities of this group of instruments, as they are suggested by a study of the survivals—



Explanation of Plates II and III.

PLATE II.

Fig. 1. Double "hornpipe" from the Grecian Archipelago, obtained by J. Theodore Bent, Esq., at Dio Maria Village, Tenos.

„ 2. Side view of same.

„ 3. Upper portion of same with gourd mouth-piece removed shewing position of sounding reeds.

„ 4. One of the sounding reeds removed.

„ 5. Bagpipes, from the Grecian Archipelago, obtained by J. Theodore Bent, Esq.

„ 6. One of the sounding reeds removed.

„ 7. Pibcorn from the Island of Angelsea, described and figured by the Hon. Daines Barrington (copied from the "Archeologia" for 1779).

„ 8. Back view of the pipe, with end pieces removed, showing reed *in situ*.

„ 9. Sounding reed of same.

PLATE III.

Fig. 10. Double reed pipes, Zummárah, Arab, from Egypt.
„ 11. Single reed pipe, Arab, from Egypt.
„ 12. Double pipes, Toomeri, Deckan, India; Museum of Indian Institute, Oxford.
„ 13. Same, with gourd removed showing sounding reeds *in situ.*
„ 14. Hindoo "hornpipe," with double pipes, and large gourd reservoir, side view; Museum of Indian Institute, Oxford.
„ 15. Same with gourd and horn bell-mouth removed, front view, showing sounding reeds *in situ.*

DR. MACNEILL read the following Paper on behalf of the Author:—

The ANCIENT PEOPLES *of* IRELAND *and* SCOTLAND *considered*

By HECTOR MACLEAN, Esq., M.A.I.

ASSIDUOUS research has now, at least, ascertained that, in early times, such migrations of tribes took place that autochthones are hardly to be found in any country, and that such were not found even many thousands of years ago. Most peoples, however backward, retain a legendary history of their forefathers corresponding to the state of their culture and beliefs, of their wild fancies and unbounded credulity. It is well when such traditions can be recorded, and can be had from original sources, as is the case with "The Ancient History of the Maori," by Mr. John White, who says:—"The histories of other peoples are based upon monuments, inscriptions on wood and stone, or upon other records. The Maori had not reached this state of advancement, and, though he valued knowledge in the highest degree, it was entirely preserved in memory and transmitted orally.

"He had for ages held tenaciously to the mode of life imposed upon him by the laws and customs of his mythology, and he held his sacred knowledge in such awe that to divulge it to those not of his own race, or even to the junior branches of his own people, was to incur the penalty of death. So thoroughly was he imbued with the principles of his early teaching that even after he had been taught and had adopted the tenets of the Christian faith, his priests would not dare to disclose some of their secrets."

Evidently, during a long period of the early and infant progress of tribes and confederacies of tribes, their history, garnished by fancy and imagination, is transmitted by oral tradition; and as tribes and peoples intermix, amalgamate, or conquer one another, so do also their dialects, traditions, and superstitions blend. Undoubtedly, in the far-off, dim past, the more cultured nations exerted, by intercourse, a civilising influence on those which were more backward. Egypt and the Western Asiatic nations promoted the advancement of Greece and Italy, while Greece and Italy introduced their culture to peoples further west.

As regards the British Isles, we derive some information from Greek and Roman writers, and as the Romans effected the conquest of Britain and its colonisation, more especially Britain south of the firths of Forth and Clyde, our knowledge consequently of Britain to the south of these firths, during Roman occupation, is more circumstantial than of North Britain; and as for Ireland, it never came under their sway, so that we know even less of it from them directly than of North Britain. Had the legendary history of Ireland been written by the first Christian missionaries who had settled there, then we might have had a record such as White's "Ancient History of the Maori"; but, nevertheless, we can still, by study and research, acquire good notions of it from ecclesiastical and bardic records in which it is intermixed and confused with Biblical and classical lore.

Although the first peopling of Britain would take place across the narrowest passage by sea between it and the Continent, yet as mankind had multiplied and improved in navigation, Ireland and South-west Britain were sure to be invaded from the south-west of Europe, from the west of Spain and France, and no doubt successive Iberian colonies took and retained possession of Ireland, before the Kelts made their appearance in the island. Before Christianity had been introduced, as in the case of New Zealand, the story of its wars, invasions, and colonisations would be handed down orally, and perhaps otherwise, by bards and druids through many succeeding generations. Whatever the primitive legends of the heathen Irish were, Irish ecclesiastics, versed in Greek, Latin, and Biblical learning, attempted to explain them by the history given in the works of Greek and Roman authors and in the Bible. The careful and persevering student, by comparison of old Irish legendary history with the wonderful discoveries made, in recent years, in Egypt, Palestine, Assyria, and Babylonia, may arrive at considerably probable results with respect to old Irish legendary history. *Eriu* is the oldest form by which the name *Eirinn*,

the name by which the island is known at present to the Gaelic speakers of Ireland and Scotland, is found in old Gaelic or Irish records. It is clearly a contraction or wearing away of the name Hibernia, though somewhat less so than York from Eboracum. The Welsh name is Iwerddon, which is a little closer to the original name.

Mr. Hyde Clarke, at p. 8 of his "Iberian and Belgian Influence in Britain," in referring to the names of islands, states:—"The meaning of the words can very well be made out; it refers to the roundness or circular form, or self-contained round or enclosure, which marks an island. This is the reason for which names of allied meaning are represented on the coins, as sun, moon, vase, or pot, which are round, as was the ship in its primitive shape. The fish was regarded as round, and other animals found on island coins are the crab and tortoise. Island is the same idea or root as mountain, and hence the names for islands and for mountains are the same. As rivers flow from mountains, so are they of the same nomenclature differentiated. Thus my first suggestion of the names of Britannia and Hibernia was so far accurate; but island is not derived from river, but from mountain, and river from mountain.'

Then follows a list of compared names at p. 9, in which the name *Britannia* is compared with the river name Bradanus, and *Hibernia* with the mountain name Hebron and the river name Hebrus.

The genitive of *Érin* is *Érenn* and the dative *Érinn*. In Middle Irish *Erin* passed into *Éire* and the genitive into *Éireann*.

At pp. 5, 7, of Kelly's edition of Dr. Lynch's "Cambrensis Eversus," it is related of Laeghaire, son of Niall, that "He defeated the Lagenians and received the Boromean tribute; but they rose against him, once more, and having gained a victory, compelled him to swear by the moon and the winds, that he would never more demand that odious tribute. In violation of his oath he marched against them, but was killed by lightning near Caissi, in *Ui Faelain*, between the two mountains, *Éire* and *Alba*, according to the ambiguous prophecy that he would be slain between Eire and Alba, the Irish names of Ireland and Scotland, A.D. 458."

It appears, therefore, from this statement, that in the fifth century two mountains in Ireland were named *Éire* and *Alba*, and this fact confirms Mr. Hyde Clarke's theory.

It is highly probable that the name Hibernia, besides being applied to the whole island, was also applied to several districts of it as signifying mountain land, or country, and that several

districts in Scotland were also so named. In Ireland there is Loch Erne and Ireland's Eye; in Gaelic *Loch Eirne* and *Inis Eireann*. Richard of Cirencester relates that "The Lucani were situated where the river Ibernus flows into the ocean," and he mentions the Ibernii who lived in the south.

In Scotland is Auldearn (*Allt-eireann*, Rivulet of Eireann), a parish containing a village of its own name in the county of Nairn; the river Findhorn is called, in Gaelic, *Abhainn Eirne*, the river Eirne, a river of the counties of Inverness, Nairn, and Murray, which rises in the *Monadleadh* hills between Strathdearn and Stratherrick. There are *Strathearn*, *Loch Éarn*, and the river *Éarn* in Perthshire.

Banbha is also another old name for Ireland, which has too its counterpart in Scotland, in Banff, the name of a town and county in the north-east of Scotland, and still called, in the modern Gaelic of Scotland, *Bainbh*. The old form of the name of the town of Banff is "bánb," so written in a grant made to the monastery of Deir by King David I, of Scotland, and recorded in the Book of Deir. This name would seem to be totemical; for it is, very nearly in form, the same as "*Banbh*, a pig," and the corresponding cognate word in Welsh is "*Banw*." Both *Éire* and *Banbha* were, according to the Irish legend, queens of the tribes of *Dé Danann*, and *Éire* appears to have been a frequent woman's name in Ireland in olden times. Dr. Joyce states in his "Irish Names of Places," that "there are, for instance, two places in Antrim called Carnearny, in each of which a woman named Éire must have been buried, for the Four Masters write the name *Carn-Ereann*, Eire's monumental mound." (Joyce's "Irish Names of Places," First Series, p. 109.)

Keating tells us, in his "History of Ireland," that the third name in the order of time was *Inis-Ealga*, which he explains as meaning "Noble Island." O'Reilly's Dictionary gives "Ealg, the face; an old name for Ireland; noble, excellent;" McL. and Dewar's "Gaelic Dictionary" gives "*Eilgheadh*, levelling a field for sowing; fallow-ground; a first ploughing of land that requires a second to prepare it for seed." The meaning, "noble," assigned both by O'Reilly and Keating, seems to be fanciful, and I should be inclined to explain the word by the Basque "*Elge, champ*, plaine cultivée;" that is, a cultivated field or plain, and the Albanic Gaelic word *Eilgheadh*, field cultivation. Consonant with this view, *Inis Ealga* would signify island of cultivated fields or plains, which contrasts with its oldest recorded name, "Island of the woods." Inis Ealga has its counterpart in Glenelg in the county of Inverness in Scotland. In Gaelic the name is *Gleann-Eilg*, that is, Glen of *Ealga*. Glenelg gives name to a parish on the west coast of

Inverness-shire. The coast, except in the bay of Glenelg, and within the sea-lochs, is generally high and rocky. The village of Glenelg is situated in level and arable ground at the bottom of one of the valleys in the parish called Glenmore. The name, *Fodhla*, would seem to correspond with that of the ancient Irish people Vodiae mentioned by Ptolemy. *Muicinis* (Pig's Island) would appear to be a translation of *Banbha*, made by the Kelts when they first settled in the island. *Inis Fáil* is another name very frequently occurring in old Gaelic tales and poems.

Fál denotes "king," and *Fáil* is the genitive. *Inis-fáil* therefore signifies King's Island. The stone on which the kings of Ireland were crowned has a strange fictitious history which has been transferred to the stone on which the ancient kings of Scotland were crowned. Scotch historians maintained that the stone carried away by Edward I, which was the coronation stone of Scotland, was the *Lia Fail*. Irish historians deny this, and maintain that the stone is still in Ireland. Dr. Skene, who has examined the Scotch coronation stone, comes to the conclusion that it is a piece ot Scotch old red sandstone. So it cannot have come from Ireland; but the word *Lia Fail* means King's Stone, and would apply to any stone which was used as a seat for a king when being crowned. Muicinis, Pig's Island, is said to have been a name given to the island by the Children of Milidh, that is, by the first Kelts who arrived in it. When they came, according to Irish legendary history, to the mouth of *Inbher Slainé*, which is called the harbour of Loch Garman now, the tribes of *De Danann*, with their druids, assembled to meet them there, and they practised druidism, that is, sorcery on them, so that the island appeared to them in the form of a pig, so that, consequently, they named Ireland, Muicinis, that is, Pig's Island. From this legendary explanation, it may be inferred that a pig was the Dedannian totem or mythological name for Ireland; that *banbh*, a pig, is a pre-Keltic word, and that from it is derived *Banbha*, one of the Dedannian names for Ireland. Again it may be reasonably assumed that Muicinis, Pig's Island, is a Keltic translation of Banbha, which has the same signification.

Old Irish legend tells us that Eire, Fodhla, and Banbha were three Dedannian queens, who respectively gave their names to the island. *Inis Fail*, King's Island, was also a name given to it by the Dedannians.

The name *Inis-Ealga* was given to Ireland by the Firbolgs, and has already been explained. Although *Ealga* seems to me to be cognate with the Basque Elge, I am not to be supposed as implying that the Gaelic word is derived from the Basque word,

but that both have their root in an older Turanian dialect than any of the Basque dialects. It would appear somewhat probable that the following Gaelic words compared with Basque words have a pre-Aryan origin, and that both they and the Basque words compared with them are to be traced to Turanian dialects belonging to very ancient times which Mr. Hyde Clarke calls the Iberian Epoch:—Gaelic, *Adharc*, a horn, Basque, *Adar*: G., *Arrach*, likeness, spectre; B., *Aran*, appearance; G., *Aithre*, a beast of the cow kind; B., *Arthalde*, a flock; *Eirich*, rise; B., *Eraik*, raise; G., *Earba*, a roe; B., *Erbi*, a hare; G., *Airne*, kidneys; B., *Erran*, kidney; G., *Eas*, an inseparable negative prefix; B., *Ez*, no, not, also used as a prefix; G., *As*, milk; B., *Ezne*, milk; G., *Ce*, night; B., *Gai*, night; G., *Call*, loss; B., *Gal*, to lose; G., *Garadh*, a warming or heating; B., *Gar*, flame; G., *Giblion*, entrails of a goose; B., *Gibel*, liver; *Gibelmin*, gall; G., *Corrach*, steep; B., *Gora*, high; G., *Carraig*, a rock; B., *Harroca*, a stone or rock; G., *Cil*, death; B., *Hil*, death; G., *Ed* or *Eid*, cattle; B., *Idi*, an ox; G., *Iasad*, a loan; B., *Jesan*, to borrow; G., *Ceo*, mist, denotes smoke in the Gaelic of the Outer Hebrides; B., *Khe*, smoke; G., *Arr*, a stag or hind; B., *Oren*, a stag; G., *Airghir*, a cow calf; B., *Orax*, a male calf; G., *Sabhal*, a barn; B., *Sabai*, a barn; G., *Tamh*, rest, repose; B., *Thai*, stop, repose; G., *Airne*, a sloe; B., *Arhan*, a plum; G., *Arthrach*, a ship, wherry, or boat; B., *Arran*, an oar. Gaelic is here used not restrictively, as meaning the Scotch dialect of the language, but for this tongue in general, comprehending old and modern Irish, Scotch, Gaelic, and Manks, written and spoken.

It may be said that the oldest native Gaelic stories which treat of the first peopling of Ireland, are mingled with the Bible stories of Adam, Noah, and the flood, along with a sprinkling of ancient Greek and Roman legend. Now this is what was to be expected from the conversion of the natives to Christianity. The first peopling of the island is traced to Spain, which is called in old Gaelic *Easpáin*, a modification of the Latin Hispania, from which it comes. The Irish foreign geographical names are mostly borrowed from the Latin, as was to be expected, as it was the learned language of Christianity, and the language in which all Irish theological books and biographies of saints were written till modern times. At an early period of Irish Christianity, nevertheless, glosses to theological books and poems were written in the native tongue, and that old foreign geographical names should be superseded by Latin ones was to be expected, in fact, could not be otherwise. Still we trace in this legendary history something that is essentially native; and comparing the old written legends

with the simple tales and ballads collected among the Gaelic-speaking peasantry of Ireland and Scotland, we find frequently in some of the variants "*An Iar ma Dheas*" (the South-west) taking the place of *Easpain* (Spain), *Gréig* (Greece), Africa (Africa), and so forth. One tale respecting the first peopling of the island is that three fishermen were driven by a high wind from Spain, against their will, to Ireland; were pleased with the appearance of the island, and returned for their wives to Spain, and after having come back to Ireland, the flood was sent to them at Tuaigh Inbhir (the ancient name of the Bann at Coleraine), so that they were drowned. Their names were Capa, Laighne, and Luasad. Another tale recounts that Ceasair, the daughter of Bioth, the son of Noe, came into it before the flood. Bioth, Fionntain, and Ladhra, with their wives Ceasair, Barrann, and Balbha made a ship, took fifty maidens with them, and went to sea. At the end of seven years and a quarter on sea they took harbour at Dun nam-barc, in the district of Corca Dhuibhne (probably Dunnamark near Bantry). *Ard-Ladhrann*, in the county of Wexford, is so called from Ladhra; *Sliabh Beatha* (now Slieve Beagh, near the town of Monaghan) from Bioth; *Feart Fionntain* (Fionntan's grave), over Tultuinne, a hill rising over Loch Derg, from Fionntan; Carn Ceasrach, in Connaught, from Ceasair. All these speak of Ireland being peopled from the west by persons who arrived by sea from the south-west. *Fionntan* is a frequent old Irishman's name, but *Ceasair* and Ladhra would seem not to be explicable by Gaelic; *Bioth* signifies World, *Barrann*, a contraction of *Barr-fhionn*, Fair-hair, and *Balbha*, dumb or silent woman. Capa-Laigne and Luasad would also seem to be inexplicable by aid of Gaelic.

Several conquests of Ireland are related by legendary chroniclers and bards. The first is that of Partholón. Partholón is said to have been the son of Sera, the son of Sru, the son of Esru, the son of Fraimint, the son of Fathachta, the son of Magog, the son of Jafeth, and came to take it after it had been a desert three hundred years after the flood. Partholón is said to have set out from Middle Greece, that he went through the Torrian Sea to Sicily, and with the right hand to Spain till he reached Ireland. In two months and a half he took harbour in Inbhior Sgéine in the western part of Munster. Dealgnaid was the name of his wife; the names of his three sons were Rughruidhe, Slainge, and Laighlinne. Partholón dwelt first at Inis Saimher, near to the river Erne. The seventh year after Partholón had taken Ireland the first man of his people died; that was *Feadha* (wood *man*), son of *Tortan* (little cake), and *Magh* Feadha (plain of wood) is so named from him.

The route of this people from Greece to the west of Ireland fully corresponds with old Iberian movements. How far the story is wholly or partially fiction is entirely another question. Some of the chroniclers speak of another conquest of Ireland before Partholón; that is, the conquest of Ciocal (pronounce Keekal), the son of Nel, the son of Garbh, the son of Uthmhoir, from Sliabh Ughmhoir, and Lot Luaimhneach was his mother. They lived two hundred years by fishing and fowling till they met with Partholón in Ireland, and the battle of *Magh Iotha* (plain of corn) was fought between them, in which Ciocal fell, and in which the Fomorians were destroyed by Partholón. It is related that Ciocal and his people took harbour in Inbhior Domhnann, now the Bay of Malahide, in the county of Dublin.

We are told that the second conquest of Ireland was effected by Neimhidh and his sons. His descent, like that of Partholón, is traced to Magog, and "all the colonists who took Ireland after the flood descend from the children of Magog." The Irish bardic historians inform us that Neimhidh journeyed, when he was coming into Ireland from Scythia, on the narrow sea which is coming from the ocean that is called Mare Euxinum; that he gave his right hand to the Riffean mountains till he came into the northern ocean, and his left hand to Europe till he came to Ireland. The name of Neimhidh's wife was Macha, and Ard Macha (Armagh) is said to have been so named from her. Macha is one of several names for the Royston crow, which was the emblem of the Irish goddess of war, and several other renowned ancient Irishwomen were so called. All the other ancient recorded conquests of Ireland were made from the south-west, but Neimhidh and his tribe come from Asia by the north of Europe to the island. Neimhidh, the genitive of which is Neimhiodh. The Nemetatae were, according to Ptolemy, a people of Hispania Tarraconensis, and Nemetobriga was a city of the same part of Hispania, according to the same authority. Nemetacum was a town of Gaul, and the Nemetes were a people of Germany at the west of the Rhine. The Vangiones, Tribocci, and Nemetes, Tacitus tells us, were of German origin, and he says that the Treveri and Nervii resembled the Gauls in person and weakness, but the Gauls of Tacitus form a strong contrast to those of Livy.

It is certainly very probable that the Nemetatae of Spain, the Nemetes of Germany, and the Irish children of Neimhidh belong to a common original stock. In Dr. O'Donovan's supplement to O'Reilly's "Irish Dictionary," *Neimheadh* is a poet, "a lawful person," "a chief, a noble," "a king or bishop," "a musician, carpenter, or smith." There is considerable probability that the original meaning of the word was *man*.

There is the word *neimheadh*, a cow, which seems to have no relation to the other word than that of a homonym. It is evidently like many other words found in Gaelic—of pre-Aryan origin. Cow, in the Chinese of Nankin and Pekin, is Niū, and in that of Shanghai is Nieu. In Gyámi it is Neu, nyeu; in Gyārung Nye-nye; in Burman (written) Nwā, (spoken) Nua, nwau; languages on the frontier of China and Thibet. ("The Non-Aryan Languages of India and High Asia," W. W. Hunter, p. 113.) Like the tribe of Partholón before them, the children of Neimhidh, we are told, had fierce wars with the Fomorians, a name in the original signifying sea-farers, whom the old Irish chroniclers designate "sea rovers of the race of Cam who fared from Africa." The children of Neimhidh won many battles first, but ultimately the Fomorians were victorious and exacted heavy tribute from the children of Neimhidh.

The Firbolgs were the next people who seized and colonised Ireland after the children of Neimhidh. Their five chiefs, Slainghe, Gann, Seanghann, Geanann, and Rughraidhe, who are traced in descent to Neimhidh, divided Ireland into five provinces, whereof they were respectively chiefs; and royal government began with them. They were, according to Irish bardic historians, descended from a portion of the children of Neimhidh, who fled from the oppression of the Fomorians to Greece.

The Greeks subjected them to great tyranny, forced them to dig the ground, raise the earth, and carry it in bags of leather to put it on the rocky surface in order to produce a fertile soil there. They resolved to escape from this oppression, and, according to an ancient Irish manuscript, stole the fleet of the king of Greece, and came back in it to Ireland. They crossed the sea, the old bards inform us, reached Spain, and thence arrived in Ireland.

Irish historical writers have endeavoured to identify the Fir-bolgs with the Belgæ; but at p. 276 of his "Celtic Britain," Professor Rhys says of the Belgæ:—"Neither the people nor its name had anything whatever to do with the Irish Fir-bolg"; nevertheless, the learned professor assigns no reason for this strong assertion. The legend of the "bags of leather" is based on the assumption that *bolg*, in *Fir-bholg*, is identical in meaning with the Gaelic *bolg*, a bag; and on this supposition the legend of carrying the bags full of earth by the Firbolgs in Greece, is founded. *Fear*, in *fear-bolg*, is a Gaelic gloss on *bolg*, which denotes *man*, and is explained by the prefixed *fear*, which signifies *man* or *fir* in *Fir-bholg*, which signifies *men*; as may be illustrated by numerous words wherein one language has encroached upon another, as in the case of Norse and Gaelic;

thus, *Eas-fors* is the name of a waterfall in the island of Islay, and of another in the island of Mull—two islands in the Hebrides. The first part of this name, *Eas*, means a waterfall in Gaelic, and the second, *fors*, the same in Norse; and so it is with Firbolg. So *boly* meant man or men in the language spoken by the Firbolgs, and was not understood correctly by the Keltic conquerors. At p. 8 of Mr. Hyde Clarke's "Notes on the Ligurians, Aquitanians, and Belgians," he says:—"The general name of Belgian, like that of Ligurian, is recognisable. It is man as in other cases." And further on, in the same page, he states:—"The Belgians in no general respect differed from the inhabitants of pre-Keltic Gaul. The distinction drawn by Cæsar is consequent on the occupation of midland Gaul by the Aryan invaders, thus sundering the northern Iberians or Belgians from the southern Iberians or Aquitanians, as also from the Ligurians."

"We find, also, that the district was settled with Iberian cities, and that this occupation extended to these shores of the North Sea, if not further, and even to the amber deposits." That the Firbolgs were the same people as the Belgæ, before the latter had been intermingled with the Kelts, there would seem to be hardly any doubt.

The Firbolgs consisted, in fact, of three septs—the Fir-bolgs the Fir-Domhnanns, and the Gaileons. Domhnann is the genitive of a Gaelic name of which the nominative was probably *Domhan*, and cognate with Damnii. At p. 12 of his "The Iberian and Belgian Influence and Epochs in Britain," he enumerates the Damnii in Britain and Hibernia as tribes whose name was derived from a prehistoric name for man. The name of this sept of the Firbolgs is preserved in the old Irish names, *Inbhior Domhnann* (river-mouth of Damnii), now the Bay of Malahide, in the county of Dublin, and *Iorrus Domhnann*, equivalent to *Iar ros Domhnann* (west promontory of the Damnii), now the barony of Erris, county Mayo. There are Gaelic words which appear to be allied to this name, such as *damh*, a people, tribe, or family; *daimh*, relationship; *daimheach*, a relative, friend, or associate; *dáe*, a man.

The Damnonii or Damnii of North Britain, according to Dr. Skene in his "Celtic Scotland," extended from the Selgovæ and Novantæ, south of them as far north as the River Tay, south of the firths of Forth and Clyde; they possessed the modern counties of Ayr, Lanark, and Renfrew, and north of them the county of Dumbarton, and the western half of the peninsula of Fife. The Irish Damnii were, in all likelihood, an offshoot of these.

When the Romans built the wall between the firths of Forth

and Clyde, it passed through the territories of the Damnonii and divided them into two parts, one of which within the wall was subjected to the Roman Government, and the other was beyond Roman Britain. The historian speaks of the tribes without the wall as grouped into two nations—the Caledonii and the Mæatæ. The Caledonii included the northern tribes of which the Caledonii were the leading tribe, and the Mæatæ those extending from the Caledonii to the wall. Adamnan, in his life of St. Columba, mentions the Mæatæ, whom he designates Miathi or Miati, with whom the Albanic Scots were at war, and who were defeated in battle by the latter in 596.

The name Mæatæ, Miathi or Miati, very probably signifies, like numerous other pre-Aryan names of tribes, *men*. Mies denotes man in Finnish; in Tibetian, Mi; in Serpa and Múrmi, languages in Nepal, Mi, signifies *man*, as it does in Bhútani, in north-east Bengal, and in Mithán Nágá on the eastern frontier of Bengal. ("The Non-Aryan Languages of India and High Asia," by W. W. Hunter, p. 139.)

The fifth conquest of Ireland was that of the *Tuatha Dĕ Damann* or Dedannian tribes, who are said to have come from Achaia in Greece, where, being skilled in sorcery, they exercised it on enemies of Greece, who had come in a great fleet from Syria. The Syrian people consulted a druid of their own, by whose directions the druidism of the Dedannians was thwarted, and the result was that the Syrians were victorious over the Greeks. When the Dedannians observed that the people of Syria were prevailing over the Greeks, they departed through fear of them, out of Greece, and they did not stop until they reached Norway, or the country of the *Fair Lochlann-men;* where the people welcomed them for their great acquaintance with science and with numerous arts. He who was chief over them then was Nudaioha Airgwdlámh (Nuadha of the Silver-hand) of the race of Neimhidh. They obtained four cities for teaching the young people of Norway in them. After having been for a length of time there, they went to Alban (Scotland), and were for seven years at *Dobhor* and at *Iardobhor*, after which they came to Ireland. They landed in the north of Ireland, fought with the Firbolgs, and gained the battle of Moytura South over them, in which Nuadha of the Silver-hand lost his hand. Thirty years thereafter the battle of Moytura South was fought between the Dedannians and the Fomorians wherein Balar, the chief of the Fomorians fell and Nuadha of the Silver-hand lost his head.

The older form of the legends, as contained in Maelmurra's poem, does not mention Partholón's colony; names the Firbolgs as the first colonists, and identifies the children of Neimhidh

with the Tuatha Dea. Gillacaoman, in a poem quoted by Colgan, also identifies the children of Neimhidh with the Tuatha Dé Danann. As the Tuatha Dea and Tuatha Dé Danann are both identified with the Nemedians, it would seem that *Danann* stands for another people united to the Tuath Dea, and that this people was the Fir Domhnann, one of the septs of the Firbolgs. The Ravenna Geographer gives *Dannoni* for Ptolemy's Damnonii, which differs but little from *Danann*, in Tuatha De Danann. The Tuatha De Danann lived, bardic chroniclers tell us, seven years at *Dobhor* and *Iardobhor*, in the north of Alban, before they went to Ireland, from which it may be inferred that the Damnii of Ireland were a branch of the Damnonii or Dannoni of North Britain, and that they and the Nemedians became one people. *Dobhor* signifies water, and also a boundary. As the Damnonii had the River Tay to the north of them, and as their territory included the basins of the Forth and Clyde, *Dobhor* seems likely to have been the portion of their territory bordering on the Tay and *Iardobhor* (west water or boundary), that portion of it bordering on the rivers Forth and Clyde. The towns enumerated by Ptolemy in the territory of the Damnonii were six in number—three south of the firths—Colania, Coria, and Vandogara; and three to the north of them—Alauna, Lindum, and Victoria. They appear to have been in advance of the tribes north and south-west of them in culture, which gives foundation to the knowledge of arts and sciences ascribed by the old Irish bardic chroniclers to the Tuatha Dé Danann.

The names of three of the Irish provinces—Leinster, Ulster, and Connaught are in the original Gaelic, Laighin, Ulaidh, Connacht; which names are not territorial, but signify the people of these respective provinces. Laighin is a nominative plural, the genitive plural of which is Laighean, which may very probably be, as in the case of so many other Gaelic substantives, the nominative singular. In recording events relating to the Lagenians or people of Leinster, Irish writers use *Laighnibh*, the dative of place, otherwise the locative of Laighin for Leinster. This name bears considerable resemblance to Ligyes and Ligures; which names are given as signifying *man*, at p. 3 of Mr. Hyde Clarke's "Notes on the Ligurians, Aquitanians, and Belgians." Ulaidh is a plural substantive denoting a people, and like Laighin, is not territorial; the genitive plural is Uladh, which was probably also the nominative singular. "*In Ulster*" was written in the original Gaelic, *in Ultaibh*, that is, in Ultonians.

Connaught is, in the original Gaelic, *Connacht*, a modification of *Conn-iocht*, which denotes children or descendants of Conn;

but the old name of the province, as given by Ptolemy, was Nagnatai. This seems to be a name given to a pre-Keltic people by Kelts or Gaels. The *na* would appear to be a fragment of the nominative plural of the old Gaelic article, and the second part, *gnathai*, is apparently cognate with *gnáth*, a manner, fashion, or custom; *gnathach*, continual; *gnath-bheurla*, vernacular tongue. In Albanic Gaelic there is the compound word *Gnàth-mhuinntir*, signifying native people; and Nagnata was applied by the Gaels to the people who preceded them in the occupation of Connaught.

The first part of the name Munster, *Mun*, is a contraction of *Mumhan*, the genitive of *Mumha*. The *mh* is silent both in modern Albanic and Irish Gaelic. It was anciently Muma. This name bears a strong resemblance to the Akkadian *mamu*, to dwell, plain, country; and the last syllable, *ma*, to the Finnic *ma*, land. "The Esths," says Dr. Isaac Taylor, in his "Etruscan Researches," p. 342, "call themselves *Rahwas*, the 'people,' their country *Ma-rahwas*, the land of the 'people,' and the name of their chief city, Revel, is a corruption of Rahwa-La, the place of the people." Among the broken tribes of Nepal, earth is *máti* in Darhi; *mato* in Denwir; *mati* in Kuswar; and *máti* in Tharu. (W. W Hunter's "The Non-Aryan Languages of India and High Asia," p. 118.) There is good ground for inferring that all these names are cognate, and that Munster was, in ancient times, colonised by an Altaic people.

Rhobogdii has evidently become the modern *Rúta*, anglicised Route, the north part of county Antrim. *An Ruta*, the Route, is still a living name in the songs, tales, and Gaelic of the Scottish Highlands. B, in Gaelic, undergoes what Zeuss calls the vowel inflection, which ordinary Gaelic grammarians call aspiration, and when this happens b takes the sound of v. In numerous words aspirated b is vocalised, and acquires the sound of oo; again, g aspirated is a sonant spirant. In this case, in consequence of these changes, the name becomes *Rúta*. It is such another instance as is Eboracum metamorphosed into York. The first syllable, Rho, is the equivalent intensive, *ro*, very, and the rest of the name, bogdii, appears to be related to the Gaelic verb *beacaim*, "I dwell," and to signify dwellers or inhabitants. Rhobogdii, then, means the real or old natives, a name given to them by the Goidels or old Gaels.

The Vodii dwelt in the northern part of county Cork, and, as already mentioned, would seem to have given the name Fodhla to Ireland. This people were seemingly of Finnic origin, and related to the following tribes mentioned in the following passage from Dr. Taylor's "Etruscan Researches," p. 78:—"The name of the Budii, another Median tribe, is also a Finnic

tribe name which is seen in the tribe names of the Vod and Wotiaks, and in the town-name of Buda in Hungary. Another Median tribe name, that of the Matiani, as well as the national name of the Medes, contains the common Ugric tribe name, *mat*, which is the precise equivalent of the Turkic *ordu* (horde), and means "tent."

Fodhla is probably equivalent to *Vod-la*, the place of the *Vod* or *Vodii*. One of the seven Pictish divisions of North Britain was Fodla or Fotla, to which the Dalriadic Scots, or Gaels, prefixed *ath*, next or other; so Athfhóthla signifies the other *Fodhla*. It is recorded in the Annals of Ulster that in the year 739 Tolarcan mac Drostan Rex Athfhothla was drowned by Aengus, and the same event is mentioned, at the same date, in the Annals of Tighernach. This Tolarcan was a Pictish sub-king. Athfhothla has been contracted into Athol, which is now a district in Perthshire.

The Lucani were a tribe in the south of Ireland whose name corresponds to that of the Lugi who dwelt in Eastern Ross and East Sutherland. In the region of Arracan and Burmah, Lu denotes *man*, in Burman, and, in Sak, *Luán* is an obsolete Gaelic word for son, and *Luan* means lad, champion, &c. The *an* of these words shows them to be diminutives which point to a primary word signifying man.

The Venicones occupied the present counties of Forfar and Kincardine, and the Venicnii, a name that differs but slightly, inhabited the county of Donegal in Ireland.

In the region of Siam and Tenasserim, khom means *man* in Siamese; kun, in Ahom; kun, khun, in Kámti; and Khon, in Laos. ("The Non-Aryan Languages of India and High Asia," p. 139. W. W. Hunter.)

The country of the Vacomagi comprehended Murray, Strathspey, Badenoch, and Athol. The second syllable of the name com, denotes kindred in Gaelic, and *coma* varies but slightly from kami and kumi in Kámi and Kumi, two languages in Arracan (*Ibid.*, p. 139).

The Smertæ were situated to the west of the Lugi and dwelt about Loch Shin. The S of this name seems to be prosthetic, and the name would appear to be properly Mertæ. It is now ascertained that the ancient Medes were Turanians. According to Canon Taylor, in his "Etruscan Researches," p. 78:—"Many of the Median tribe names are of the Finnic type. Thus, the name of the Mardi, one of the Median tribes, contains the characteristic Finn gloss *mart* or *murt*, 'men,' which occurs in the names of a very large number of Finnic tribes, such as the Mordwin and the Komi-murt." Smertæ or Mertæ, therefore, denotes men. In the Sunwar language, Nepal, Múrú signifies

man. *Muir* and *muireann* denote woman, and *muirn* means a troop or company, in Gaelic.

The Cerones and Creones occupied the north-west of Argyllshire and the south-west of Inverness-shire. The first parts of these two names, *Cero* and *Creo*, are obviously cognate with *Karu*, "man," in Mon or Talain, one of the languages of Tenasserim; *Cear* means offspring in Gaelic. The Carnonacæ probably extended from the Sound of Skye to Assynt, and the Cornavii inhabited Caithness. The two first syllables of these names, Carn and Corn, correspond to *Karu;* "man," in Mon and to *koro*, "man," in Kuri, in Central India; *Cearn* signifies "man," in Gaelic.

Taezali, Taezaloi, or Taxaloi, inhabited the present county of Aberdeenshire. The terminations, *ali* and *aloi*, in the varied forms of this name, correspond to *alu*, "man," in the languages Irula and Badaga of Southern India. *Taez*, *Taiz*, or *Tax* seems to be cognate with the old Gaelic word *Tas*, a "dwelling," and so Taxaloi means the "inhabiting men," or inhabitants of the district.

The Gadeni appear to have occupied Cowal; that is, the country between Loch Lomond and Loch Fyne; and the Otadini inhabited the county of Northumberland, and probably the counties of Roxburgh and Berwick. Canon Taylor tells us at p. 340 of his "Etruscan Researches," that the "root sen enters largely into the ancient Siberian tribe names"; and that "the same root appears as a suffix in the names of the Alani, the Roxalani, the Cumani, the Huns, the Ussuni, and other nations of Ugric blood." With these may be classed the Gadeni and Otadini of Ancient Britain.

The Irians of Ireland, a people more ancient than the Heberians or Heremonians, are called in Gaelic *Sliocht Ir*, the offspring of Ir, latinised Hyrus. Ir, their eponym, means land or earth, which points to their being inhabitants of the island long before the two other peoples mentioned. Ulster was exclusively Irian, from the mouth of the Boyne to the Bay of Donegal, down to the second century. In Leinster the Irians had possession of Longford, the Queen's County, and part of Westmeath environing Uisneach Hill. The greater part of Kerry, the west of Clare, and a tract round Fermoy, were theirs in Munster ("Book of Rights," pp. 48, 65, 78, 100). They possessed Connemara, and scattered tracts in Mayo, Roscommon, Leitrim, and Sligo, in Connaught (*Ibid*). Thus the position of the Irian territories evidently shows that the Irians preceded the Heremonians, and were driven by the latter from the richer and more accessible districts of the island. It may be inferred, from Irian topography, that the race possessed the greater part of the island.

A great number of names of Irian Over-Kings of Ireland appear in the lists before Ugaine the Great; particularly, Ollamh Fodhla and his seven Irian successors. Again evidence is afforded by the partition of Ireland between the two Irian brothers, Cearmna and Sobhairche, a tradition which is supported by monumental evidence, the palaces of both, in opposite ends of the island, yet known by their names, and designated the oldest buildings in Ireland. *Dun-Chearmna*, Fort of Cearmna, was situated on the Old Head of Kinsale, in Courcy's country, in the county of Cork. *Dun Sobhairce*, Dunseverick, Sobhairce's fort, is an isolated rock, whereon there are some fragments of the ruins of a castle, near the centre of a little bay, three miles east of the Giant's Causeway, in the county of Antrim.

The Irian palace of Emania was the most extensive of its kind in Ireland. It was built, according to the researches of Irish scholars, 305 years before the Christian era, and destroyed in A.D. 322. The Irish Nennius informs us, and on this point there is reason to think that he is reliable, that the Irians were not brothers of the Heremonians and Heberians, but Picts or Cruithne. The Irian Ollamh Fodhla, and also the six Irian kings who succeeded him, are in this work called the seven Cruithnian kings that ruled over Ireland. It appears, in fact, that the Irians and Cruithnians are identical, and that they reigned in Tara before the Heremonians, but were thence expelled, and maintained themselves chiefly in Ulster, in the palace of Emania (Gaelic *Eamhain*. This word also denotes double, and as *Eamhain* had an outer and an inner wall, so it is very likely that the palace was so called from the number of the walls).

Nennius speaks of a great colony of Picts in Ireland, which were for a long time in Eri, and acquired great power there, until they were driven out by Heremon, except some tribes which remained in *Magh Breagh* (Plain of Breagh). The old Gaelic form is Mag Breg, in which Breg is a genitive plural; and in the "Lives of SS. Fanchea and Columbkille," *Sliabh Breagh* is translated Mons Bregarum, in which Bregarum points to a nominative Brega. *Sliabh Breagh*, then, signifies the mountain of the Bregians. (See "Joyce's Irish Names of Places," First Series, 4th ed., p. 423.) These Brega or Bregians, then, were Picts or Irians, and as the Gaelic eponym of the Brigantes of the south of Ireland was *Breogan*, and as they were designated *Sīol Breogain*, the descendants of *Breogan*, they were, likely, a kindred people to the Bregians, and therefore Irian or Picts. The Brigantes of Britain would seem to have derived their name from a pre-Keltic people, and originally akin to the Irish Brigantes.

At an early period the letter p was wanting in Gaelic, and in loan words from other languages, c hard, equivalent to k, was substituted for it. Britannia was converted into *Prydain* by the Britons of the south, and into *Prydyn* by the Picts and Keltic Britons of the north. Pictland, or Pictavia, was named *Cruithin Tuath* by the Scots or Gaels, in which *Prydyn* was changed into *Cruithin* and *Tuath*, means north; so *Cruithin Tuath* denotes North Britain. Many of the Picts of North Britain settled among their Irian kinsmen in Ireland, and also among the Gaels or Scots, and hence comes the eponym *Cruithne* and Cruithnigh, angl. Cruithnans, which signify Britons. Hence the confusion about the settlements of the Picts in Irish legendary history.

The name *Picti*, which Roman writers misunderstood and confounded with *picti*, "painted men," with which it has nothing to do, was the people's own name for themselves, whatever it means, and is preserved in the Lowland Scotch name for them, Pechts. In Skene's "Chronicles of the Picts and Scots," at p. 380, "Gewictis," a Gaelic form of the name Pict, occurs, which would, at first, have C substituted for P, as in the case of *Criuthin* for *Prydyn*: "and quhen Iber comme to eild, Gayele send him in yat cuntre yat now is callit Irland, and fand it vakande, bot of a certain of Gewictis, ye quhilk he distroyt, and inhabyt yat land, and callit it eftir his modir Scota, Scotia." Pictones is a name apparently cognate with Picti, and the latter people were no doubt akin to the former. The Pictones were situated along the southern bank of the Loire, and were an Aquitanian people, on account of which, evidently, Augustus extended Aquitania to the banks of the Loire. Strabo tells us that the Aquitanians resembled the Iberians more than the Gauls. They were seemingly a Turanian people.

That gynecocracy prevailed among the Picts is supported by this passage from "Tract on the Picts," p. 328, Skene's "Chronicles of the Scots and Picts:"—"And in the time of Erimon, Gub and his son, viz., Cathluan, son of Gub, acquired great power in Erin until Erimon banished them out of Erin, and they made peace after that, and Erimon gave them the wives of the men who were drowned along with Donn, viz., the wives of Bress, the wives of Buass and Buaigne; and they declared by the sun and moon that they alone should take of the sovereignty and of the land from women rather than from men in Cruthentuath for ever; and six of them remained in possession of Breaghmagh, and from them are derived every spell, and every charm, and every sneezing, and the voices of birds, and all omens, and all talismans that are made."

Lists of the names of Pictish kings contain names very

unlike the names of ancient Scottish or Irish kings; none of the latter ever begins with P or hardly ends with the same letter. At p. 5 of Skene's "Chronicles of the Scots and Picts"—the Pictish Chronicle—there occur pant, urpant, uip, uruip, and at p. 6, Vipoig Brude comes before the names on the list on p. 5 twenty-seven times, and it is probable that it means chief king. At p. 7 this passage throws light on the meaning of *ur* in urpant, &c.: "Da Drest, id est, Drest filius Gyrom id est, Drest filius Wdrost, V annis conregnaverunt, Drest filius Girom solus V annis regnavit." So from this passage it appears that *Da Drest*, "Two Drests," Drest, son of Gyrom, and Drest, son of Wdrost, reigned together five years, and that Drest, son of Girom, reigned alone five years. The *Da* (two) here explains *ur* in the names urpant, urgant, urgnith, urfecir, urcal, &c., which evidently signifies two; thus urpant is preceded by pant, urgant by gant, urgnith by gnith, urfecir by fecir, urcal by cal, &c.; so like Da Drest (two Drests), ur therefore denotes two of the name that follows it. In Georgian *Ori* denotes two; in Chinese, Nankin, Urh (ár); in Chinese, Pekin, Urh; in Gyami, Chinese frontier, A'r. (W. W. Hunter's "The Non-Aryan Languages of India and High Asia," p. 34.) In Stoke's "Goidelica," 2nd ed., pp. 106–121, the author examines the Gaelic entries in the Book of Deir (from the Abbey of Deir in Buchan, Aberdeenshire). Pet or pett occurs five times in the names of gifts of land or town lands made to the abbey at different times. Pet is usually followed by a Gaelic attributive. It is related in the first entry that Bede the Pict, who was Grand Steward of Buchan at the time, gave to St. Columba and his pupil Drostan, son of Cosgrach, the town of Deir, in freedom for ever from Grand Steward and chieftain. He also gave them in offering from *Cloch in tiprat to Cloch pette mic Garnait* (Stone of the well to Stone of pette of son of Garnat).

Mr. Whitley Stokes, at p. 120, "Goidelica," fancifully, and very unsatisfactorily, tries to identify it with the Irish Gaelic word *pit*, denoting a portion of food. It appears to me to be, evidently, a pre-Keltic word. It takes the form Pit in modern Scottish topography. In Slater's "Directory of Scotland for 1882," I have counted the names of places beginning with Pit, and they are as follows:—Aberdeenshire, 14; Fife, 25; Inverness-shire, 3; Forfarshire, 10; Sutherland, 2; Ross-shire, 2; none in Argyllshire, Dumbartonshire, Stirlingshire, Caithness, Orkney, Shetland; 1 in Haddingtonshire, the only one south of the firths of Forth and Clyde.

With *pet* or *pett*, now *Pit*, sometimes, in a few instances, yet, *Pet*, a townland, hamlet, or village, correspond Uraon *Padda*; Ho *Hattu*; Mundala, Hatu in Central India; Kota *Patti*, in

Southern India; all denoting village. (Hunter's "The Non-Aryan Languages of India and High Asia," p. 163.)

The following names of towns which would seem to be cognate with *pet* occur in Hyde Clarke's "Researches in Prehistoric and Protohistoric Comparative Philology," p. 54:—"Paita, Pita, Putu, in Peru; Pauta, in New Granada; Pitu, in Mexico; Peto, in Yucatan; Bata, in India, S.; Beda, in Mesopotamia; Pida, in Pontus; Eboda, Padua, in Palestine; Pitane, in Mysia; Patara, in Lycia."

The word *dabhach*, as signifying a portion of land, occurs in the Book of Deir. In Stoke's "Goidelica," p. 111, in an extract from the Book of Deir, there is the place-name Dabaci mentioned, and four dabhachs (*cetridabach*) free from all burthens. Probably *Dabaci* is the old Gaelic plural of Dabach.

The modern Gaelic spelling is *dabhoch*, to distinguish it from *dabhach*, a vat. In Shaw's "Gaelic Dictionary" it is said to be "a farm that keeps sixty cows"; but in McL. and Dewar's, "a farm of extent sufficient to pasture a certain number of cows, varying in different districts. In the Hebrides the number 320 is understood." At p. 117, "Goidelica," Mr. Whitley Stokes erroneously assumes that *dabhach*, a vat, is a liquid measure applied to land, as pint, pottle, and gallon are in Ireland. These last are fixed liquid measures, but a vat was never such, for vats are and always have been of various sizes. Dabhoch is an occasional place-name joined to an attributive, and sometimes contracted into *Dauch* or Doch. There are Davochbeg (Little Davoch) and Davochfin (White Davoch), in Sutherland. *Dabhach* would appear to be akin to Georgian *Daba*, "a village" (Hunter's "The Non-Aryan Languages of India and High Asia," p. 163), and to Tabi and Teabo, Yucātani to Tabeo, New Granada, and to Tabachula, Guatemala, equivalents to "town." (Hyde Clarke's "Researches, &c.," p. 57.)

Deir would appear to be cognate with Derá, denoting village in Dhimal, N.E. Bengal, but its meaning was not understood by the Gaelic speaking monks of the Abbey of Deir. Their explanation was Drostan's tears came on parting with Columcille (St. Columba). Said Columcille, "Let Déar ('tear') be the name henceforward," Stoke's "Goidelica," p. 109. In this manner Gaelic ecclesiastics, bards, and legendary chroniclers in Ireland and Scotland explain pre-Keltic names of men and places at all times. Deir was so called before it was ever visited by a Gaelic-speaking Christian missionary.

It is well understood that the Gaelic of Ireland, Man, and Scotland in the eleventh and twelfth centuries borrowed largely from the language of the Scandinavian invaders who settled among them. There is *ster*, a contraction of the Norse *stadr*, a

place, suffixed in the names of the three provinces, Ulster, Leinster, and Munster, of which the first syllables are contractions of the Gaelic names. Nevertheless, Scandinavian place-names are sparse in Ireland; the Scandinavian place-names in the island of Islay alone exceed in number all that are mentioned in Joyce's "Irish Names of Places." The amount of words borrowed from English is very large in modern written and spoken Irish Gaelic as well as Albanic or Scottish Gaelic; but the Manks Bible contains a much greater number of English loan words than either the Irish or Scotch Gaelic Bible.

It may be therefore assumed that the Kelts, after having succeeded in obtaining settlements in Ireland, would borrow considerably from the dialects of those tribes who had been settled there before them; and the dominant tribes among those were, no doubt, Iberian and Turanian. Now numerous old Gaelic words, and many are still living, bear a very strong resemblance to non-Aryan words found in the languages of the hill tribes of India and High Asia, of Africa, and of Mexico and Central America. Here follow some of them: "*Belltaine.*" This word occurs in Cormac's "Glossary," allowed by Mr. Whitley Stokes to be Old Irish, but written in Middle Irish orthography. It is still a living word in a slightly altered form; in Scotch Gaelic *Oidhche Bhealltainn* is the last night of April, and *Latha Bealltainn* is the first day of May; *Belltaine* is a genitive which seems to point to *Belltan* as the nominative. The word is preserved in Lowland Scotch as *Belten.* The first syllable *Bell* evidently signifies *Sun,* and the second part, *taine,* would appear to be the genitive of *tan,* time, now only used in the adverbial phrase *an tan,* the time or *when.* Belltaine then denotes sun's time or course, and *Bliadan,* now *Bliadhna,* a year, is derived from the same source, and means sun's time or course. The sun is named Belá in Dhimál and Kocch, N.E. Bengal; and in Khond and Chentsu Belá, Central India. (Hunter's "The Non-Aryan Languages of India and High Asia," p. 158.)

Tatha (Tay) corresponds to *Tui,* the name for water, in Kami, Kumi, and Mru, Aracan (*ibid,* 164); Carron and Garry, names of rivers in Scotland, correspond to the river names Garia in Ho (Kol), Kol (Singbhum), Bhumij, and Mundala, and in Uraon Khár, Central India (*ibid,* p. 150). Gaelic *Caochan,* a streamlet, seems related to the river names, Cauca in New Granada, and Caicus in Asia Minor. G., *Sian,* rain; the river Shannon is named *Senos* in Ptolemy, and *Sionann* in modern Irish; New Granada, Sinu; India, Sonus; Sicily, Asinarus (Hyde Clarke's "Researches, &c.," p. 49). It has been shown by Mr. Whitley Stokes that *Seine* is not derived from Sequana, the ancient name

of the river, but from *Sena*, the name of one of its tributaries. *Cottud* in Old Gaelic, a mountain, likely related to *cotadh*, a millstone; "Cotopaxi and Cotocha Ecuador, Cottia Alpns." (Hyde Clarke's "Researches in Prehistoric and Protohistoric Comparative Philology," &c., p. 51.)

Gaelic, *Tain*, water. Tanais, ancient name of the Don in Russia. Tinna, the ancient name of the Tyne, misapplied to the Tay by Ptolemy.

Gaelic words are here compared with some of the Hittite words and their cognates in Major Conder's list in his paper on "The Early Races of Western Asia," "Journal of the Anthropological Institute of Great Britain and Ireland, August, 1889," pp. 30–51. Gael., *Achadh*, a plain, a field; Hittite, *Aker*, Etruscan, *ager*, "field"; Lapp, *Aker*, "field." *An*, good, noble. Hit., An, "god"; Hit., Gu. G., *Guth*, voice, word; G., *Ceann*, enclosure (O'Davoren's "Old Irish Glossary.") Hit., Kan, Gan, "enclosure"; G., Cu, a champion, a hero, a warrior; *Cú* signifies a dog, but it seems to be rather a homonym than that the former is merely a figurative use of it, for in a ballad that recounts a fight between the great Ultonian hero, Cu-chulainn, and the Norse warrior king, *Garbh Mac Stairn*, Cu-chulainn, in his reply to the Norse king says, "I also give the word of another king, &c." Animal names become men's names, names such as Sithach, a wolf, *Faolan* (Fillan), a little or young wolf; *Sionnach*, a fox, &c.; but are not used to signify champions or chiefs of tribes or territories; thus *Cu-Connachta*, champion or chief of Connaught; *Cu-Uladh*, champion or chief of Ulster or Ultonians; *Cu-Midhe*, champion or chief of Meath; *Cu-mara*, sea champion. There is certainly ground for inferring that *cu*, in this case, is originally a different word from *cu*, a dog, and akin to Hittite, Akkadian, and Susian Ku, "king." G., *cruach*, a hill; *corrach*, steep; Hit., *Kur.*, mountain; Lapp, *kor;* Tcheremiss, *korok*. One of the three best legends of the Gaels, according to their own view of the matter, was the tale of the sons of Uisnech; one of the three sons was Nais, later Naoi; the names of the other two brothers are explained by Gaelic, but *Nais* is not. They were, of course, three princes, who eloped with their uncle's wife, whose name was Déirdre. The tale ends by their being slain in battle with King Concobor of Ulster, and Déirdre stabs herself and falls down dead beside their corpses. There are assuredly good grounds for believing that the name Nais is cognate with Hittite, Nazi, "prince." G., *Súgh*, juice, moisture, a wave; Hit., swamp; Kirghiz, *sūk*, "flowing"; G., *Tuirghen*, a king, a lord; Tuirighin, a king, a judge, a tongue, a pillar or tower; Hit., Tarka, "chief"; Etruscan, *Tarchu*, Tarchi (Tarquin); Siberian, *Tarkhan;* G., Tor, sovereign,

lord, noble; Hit., Tur, chief; G., *All*, a bridle; *álaire* occurs in some of the West Highland tales for steed; *loth*, a filly. Asia Minor words, Carian, Ala, "horse"; Hungarian, *lo*.

The Gaels, oldest written form *Goidel*, pl. *Goidil*, are supposed by some writers to have preceded the Cymry in Britain, and to have been pressed westwards by these into Ireland. There is every reason, however, to admit that the first Kelts came into Britain across the narrowest passage between Gaul and Britain, but that as they extended themselves to the west of Gaul and Spain, and had acquired a knowledge of navigation from the Iberians, who were subdued by them, they found it easier and preferable to make their way to Western Britain and to Ireland, where their Keltic kinsmen in Britain had not yet entirely conquered the non-Aryan inhabitants of Western Britain, and had not crossed the sea to Ireland. Irish legendary history brings them from Spain; but it is more probable that they came from the north-west of Keltic Gaul. The Veneti, according to Cæsar, were a sea-faring people, well skilled in navigation, and were in the habit of making voyages into Britain. Now *Féne*, one of the names by which the Irish Kelts called themselves, bears a near resemblance to Veneti. There is a difference in quantity between the first syllables, but the provection of V, equivalent of W, into F, may account for it, as also in the case of Gw in *Gwynedd* or *Gwyndud*, North Wales. There hardly need be any grounds for hesitating, although a little contrary to rule, that these names are cognate.

Connected with this old name, *Féne*, are *Féine*, a "farmer, ploughman, or champion"; *Feinne*, the celebrated militia of Ireland; *Fiann*, a soldier of the ancient Irish militia (O'Reilly's "Irish-English Dictionary."). *Feinn* is the Highland name for the same warriors, and on the tales and ballads which related their fictitious exploits, for generations, throughout the Scottish Highlands, Macpherson based his celebrated "Poems of Ossian." In a contribution to the *Scotsman* newspaper of January 16th last, by Professor Mackinnon, "On the Feinn," quoting from the "Book of the Dun Cow," part of a legend contained in it, he says:—"According to this legend, Fionn was the son of Cumhall, son of Trenmor, who was, at one time, *rigfénnid*, that is, 'king-warrior,' of Ireland, and in the service of Conn *Cetchathach*, 'the fighter of a hundred,' a monarch of Ireland who died 197, A.D."

One of the old Irish legends speaks of Heremon, the eponym of the most powerful branch of the Gaels, marrying a Dannanian princess, and the best explanation is that the first Kelts came to Ireland, like the Saxons to Britain, to aid the Britons against the Scots and Picts, to aid some Irish king or kings against

some other kings or rebellious subjects. The oldest form of *Eireamhon* is Emer. In Fiacc's Hymn, one of the Irish hymns in the "Liber Hymnorum," in line 35, we have "Patraic pridchais do Scotaibh," *Patrick preached to Scots*, and in line 37, "Meicc Emir meicc Erimon," *Sons of Emer, sons of Erimon*, in which the genitives of Emer and Erem appear, and these sons of Emer and sons of Erem are there mentioned as two branches of the Scots. In the Syllabary at the beginning of Professor Sayce's "Assyrian Grammar," p. 35, the Akkadian words, "erim, lakh," are translated soldier (host); and certainly *erim* bears a strong resemblance to Erem. Emer was, in later writings, changed to *Eber* and *Eibhear*. Professor Sayce tells us in his "The Hittites," p. 14, that "the common Assyrian title of the district in which Damascus stood, Gar-emeris, is best explained as the *Gar* of the Amorites." He informs us, at p. 15, that "the Amorites were a tall and handsome people, depicted with white skins, blue eyes, and reddish hair." They were evidently the same race as the ancient Libyans of Africa, who are now represented by the Kabyles, "who are found in large numbers in the mountainous regions which stretch eastwards from Morocco." Professor Sayce further states: "Their clear white skin, their blue eyes, their golden-red hair, and tall stature, remind him (the traveller) of the fair Kelts of an Irish village." Further on, at p. 16: "It is clear, then, that the Amorites of Canaan belonged to the same white race as the Libyans of Northern Africa, and, like them, preferred the mountains to the hot plains and valleys below." Whether Emer is to be equated with "Amaur," or rather with Ivernii, is a matter of further inquiry. The Fomorians, a name which signifies "Seafarers," who are so celebrated in Irish legendary history, were Libyans, and hailed from Northern Africa. Keating, in his "History of Ireland," calls them "sea rovers of the race of Cam, who fared from Africa." They have left some place-names in Ireland. Balar was one of their kings, and *Carn Bhalair*, in the north of Ireland, commemorates him; one of their queens was named Cethlenn (Kethlenn), and her name is preserved in Enniskillen, denoting island of Cethlenn. She was the wife of Balar of the blows already mentioned. These Fomorians fought and intermarried with the descendants of Neimhidh, and with the other peoples who succeeded them.

The name *Gaoidheal*, oldest known written form "Goidel," is defined in O'Reilly's "Irish Dictionary," "a hero." It is likely that the word is derived from *gaide*, armed with a spear, and in this case would signify a spearman, otherwise an armed man or soldier. *Clanna Milidh* corresponds in meaning. This term denotes the military or Milesian clans equivalent to *Clannanan Gaidheal*, the

clans of the Gael. The eponym *Mileadh* or Milesius is derived from the Latin *miles, militis,* a soldier, and the Gaelic *milidh,* a hero, is a loan word from the same source. Scoti, a name which has caused so much confusion, both in Irish and Scottish history, was first borrowed from the Irish warriors, in Britain, by the Romans, against whom they were fighting, and in a couple of centuries thereafter, re-borrowed by the Gaels into their own language from the Latin. In O'Davoren's "Glossary" occurs "Scath no Scoth, i Laoch"; that is, *Scath* or *Scoth* denotes warrior, or soldier. So, therefore, the Irish warriors in Britain designated themselves *Scothi,* "warriors," which the Romans modified into Scoti, and named Ireland, Scotia. It appears, then, that every name by which the Irish Kelt called himself, from first to last in Ireland, and after passing from Ireland to North Britain, meant warrior or soldier. The *th,* in Gaelic, is generally pronounced like *h* in English, but in many districts, both in Ireland and Scotland, like *j* or *x* in Spanish. It is likely that when the Scots, or Gaels, came in contact with the Romans, in Britain for the first time, in the year 360, *th* was then a mute aspirate, and then their name *Scothi* would be pronounced *Scot-hi,* which became in the Roman mouth *Scoti,* whence the Roman name Scotia for their country, Ireland,

When the Irish Kelts, or Gaels, had fully subdued and had considerably blended their blood with the pre-Keltic races, they began to invade Britain about the year 360, A.D. Subsequent to this period, when the Romans were tottering on their legs, and had at last to withdraw from Britain, they planted colonies in Wales, and conquered the Picts of Galloway, to which they gave their own name. They then allied themselves with the Picts of North Britain against the Britons, and subsequently planted a Scottish or Gaelic colony in the north-west of north Britain from Antrim county, named Dalriada, for the district in county Antrim, from which they had come; which, at first, for a length of time, was a sub-kingdom under the over-kings of Ireland, the mother country; but latterly refused allegiance to the Irish over-king, and set up an independent monarchy.

Discussion.

Mr. Hyde Clarke said they had had a Celtic evening, and the paper of Mr. MacLean dealt with one of the most complicated problems of anthropology; but its obscurity would be overcome if the canons of anthropology were applied. The strictest of these was that race and language were not necessarily correlative, or equivalents of each other. We were cautioned, too, to regard the

effects of mixture of races. Professor Huxley, a former president, and Dr. Beddoe, the present one, had shown there was a continuous element in the races of these islands, and that there were great evidences of relationship and identity throughout the populations Dr. Beddoe was inclined to recognize the basis resulting from the anterior population as Iberian, adopting the Roman suggestion. Under all circumstances the Celts would be regarded as a later and intrusive population, and of this their languages gave testimony on their decline. Here philology came in, and Professor John Rhys, Mr. MacLean, and others had shown in the Celtic elements evidence of an Iberian philology and mythology. The Iberian antecedents were further illustrated by the statement of the historian Bede as to female succession among the Picts, explained by the doctrines of exogamy promulgated by Mr. MacLennan. The Iberian populations here as elsewhere in Europe used many languages and when a sole language as Celtic came in contact the polyglot condition was swept away. The spread of great dominant languages in east and west marked great historical and anthropological epochs. Hence we find Celtic widely adopted in these islands, and by people of different races. It did not necessarily follow that any great invasion of Celts took place, like the invasion of Italy by the Gauls. On the other hand, the Iberian populations would show a weak affinity for the Celtic languages. They accepted Latin and abandoned it, they accepted English and Dano-English, and in Scotland this is readily seen, for it became an English-speaking country less by the influx of the English, than by the abandonment of the Pictish and Celtic languages. It is to be noted that the exogamous Iberians more readily intermarried with immigrants and strangers, and thus the Danes and English and Normans were largely introduced in Scotland. In these investigations place-names afforded a mass of material, and it was a great advantage to have them discussed by members of the modern school, like Mr. MacLean and Dr. MacNeill, men not only acquainted with the old literary Gaelic, but having the further advantage of knowledge of the spoken language.

Dr. MacNeill, in acknowledging a vote of thanks for undertaking to read the paper of his friend, Mr. MacLean, spoke of the gratitude due from Highlanders like himself to the labours of the members of the Anthropological Institute, who had written on the pre-Celtic and Celtic period of the history of the British races. He had personally found the volumes of their "Journal," of the utmost value in connection with some historical sketches which on one occasion he had undertaken to supply. In the case of difficult points on which the recognized historians were either utterly wrong, confused or silent, he found the papers of the Institute of very great help. He thought Mr. MacLean was one of the very few in Scotland who could deal competently with the subject of his paper that evening. The author of that contribution to their discussions was fairly free from all prejudice, racial or merely national; and the result of his inquiries, applying in the pre-Celtic periods

principles already illustrated by their Chairman, was to greatly extend the bounds of their knowledge of those early ages of the ancient peoples in these islands. Indeed the clear gains already made would fill an ample volume. Mr. MacLean's paper, in its discussion of the ancient terms which indicate the close connection that existed in early times between Albin and Erin, would largely help to a definite conclusion respecting the origins of those much-discussed peoples, the Picts and Scots.

EXHIBITION *of a* SKULL *dredged on the* MANCHESTER SHIP CANAL WORKS.

By ISIDORE SPIELMANN, F.S.A., M.A.I.

THE skull, which has been lent to me by Mr. James Abernethy, the Consulting Engineer to the Manchester Ship Canal Works, was found during dredging operations at a place called "Frodsham Score" in the township of Frodsham, and near the River Weaver.

It was found at a depth of 27 feet from the surface in fine sharp sand, and as the work at the spot named was being executed by manual labour, the skull rolled out from its resting place, as the sand in front of it was removed. A section of the soil, in which the skull was found, shows:—

1 foot of earth,
6 feet of red clay,
3·6 feet of blue silt,

and the rest fine sharp sand, under which runs New Red Sandstone the entire length of the canal works, and which crops up suddenly here and there.

Dr. Garson, who has measured the skull, finds it is 174 mm. long by 138 mm. broad, giving a cephalic index of 79·3.

There are, he says, no very characteristic marks about it, which could enable one to say with certainty to what race it belongs, or the period to which it belongs. It is not a long-barrow period skull, but rather a Celtic one, though not a very pure type. It is probably not more than 2,000 years old at the very utmost, and very likely much more recent.

Dr. Garson also says that objects found in the strata in which it lay must be the chief guide in determining the period. Unfortunately, nothing has been found except some red deer horns, and a canoe made in one piece in oak, which has been sent to the Manchester Museum.

The chief characteristic which leads one to suppose it belonged to a later period than the early bronze age is the absence of the large superciliary ridges found in the pure Celts.

I am informed that such types of skulls have been found in the bed of the Thames in clay, and are generally well formed.

Dr. Reeves, of the College of Surgeons, agrees that the skull is that of a young man aged about 23, and he is of opinion (as are some other surgeons) that the fractures to be seen at the back were caused at the time of death, and actually caused death.

It would be interesting to know *what kind* of instrument could have inflicted these fractures.

Some members of the Geological Society consider that the spot where the skull was found was formerly the bed of the River Weaver, and which has since changed its course. This they gather from the quality of the sharp river sand.

Discussion.

Prof. Rupert Jones thought the skull did not belong to a very remote period, and that, being buried in simple river sand, how long ago it was deposited would be very difficult of determination.

Mr. T. V. Holmes said that he should like to call attention to the extreme uncertainty of the age of objects found in river-deposits. A few years ago he had visited, in the company of Mr. Whitaker, the excavations then being made for the docks at Lynn. There, in gravel, at a depth of 12 foot from the surface, had been found a large number of the soles of shoes or boots, together with some old-fashioned tobacco-pipes. These objects, in spite of the depth at which they appeared, could not, however, have been more than from one to two centuries old. They had been deposited in an old channel of the river, which had changed its course since their deposition.

April 22nd, 1890.

Francis Galton, Esq., F.R.S., *Vice-President, in the Chair.*

The Minutes of the last meeting were read and signed.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From the AUTHOR.—Ten Years' Travel and Sport in Foreign Lands; or, Travels in the Eighties. By Heywood W. Seton-Karr, F.R.G.S., &c.
—— The Village Community, with special reference to the Origin and Form of its Survivals in Britain. By G. L. Gomme.
—— On Etruscan and Libyan Names. A comparative Study. By Daniel G. Brinton, M.D.
—— Mackenzie's Last Fight with the Cheyennes: A Winter Campaign in Wyoming and Montana. By Captain John G. Bourke, U.S.A.
—— Le Premier Établissement des Néerlandais à Maurice. By Prince Roland Bonaparte.
—— Le Glacier de L'Aletsch et le Lac de Märjelen. By Prince Roland Bonaparte.
—— Essai d'une Classification des Races Humaines, basée uniquement sur les caractères physiques. Par M. J. Deniker.
—— Sul Museo Dell' Imperatore Augusto. Nota di E. Regalia.
From the GOVERNMENT OF PERAK.—The Perak Government Gazette. Vol. iii. Nos. 1–7.
From the BERLIN GESELLSCHAFT FÜR ANTHROPOLOGIE, ETHNOLOGIE UND URGESCHICHTE.—Zeitschrift für Ethnologie. 1890. Heft 1.
—— Correspondenz Blatt. 1890. Nos. 2–4.
From the ROYAL SCOTTISH GEOGRAPHICAL SOCIETY.—The Scottish Geographical Magazine. 1890. Nos. 4.
From the ROYAL ARCHÆOLOGICAL INSTITUTE.—The Archæological Journal. Nos. 89–168.
From the SOCIETA ITALIANA DI ANTROPOLOGIA, ETNOLOGIA E PSICOLOGIA COMPARATA.—Archivio per l'Antropologia e la Etnologia Vol. xix. Fas. 3.
From the ACADEMY.—Bulletin International de l'Académie des Sciences de Cracovie. Comptes Rendus des Séances de l'Anné 1890. Nos. 3, 4.
From the SOCIETY.—Proceedings of the Society of Antiquaries of Scotland. 1888–89.
—— Proceedings of the Royal Geographical Society. Vol. xii. No. 4.
—— Proceedings of the Society of Biblical Archæology. Vol. xii. Part 5.
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DR. JACQUES BERTILLON, the chief of the Statistical Department of the Municipality of Paris, described and demonstrated the Method now practised in France of identifying Criminals by comparing their measures with those of convicted persons in the Prison Registers. The address was delivered in French, and translated orally by Dr. Mouat.

NOTES *on* M. BERTILLON'S DISCOURSE *on the* ANTHROPOMETRIC MEASUREMENT *of* CRIMINALS.

By F. J. MOUAT, M.D., LL.D., F.R.G.S.

THE measurement of the various bony parts constituting the framework of the human body has long been employed for the determination of races, the identification of human remains found in geological strata, and other indications having no geological significance, long before Anthropology—the natural history of mankind—became a special branch of science in our own time. They are the only means of determining the antiquity and place in nature of Man, which the changes caused by time and the agencies in operation in forming and fashioning the earth up to the present time, have left us.

Few branches of ethnology in its restricted sense have been cultivated with so much success—not the least useful outcome of which is the Institution in which we are now assembled.

One of the most interesting examples known to me of the use of bones for the purpose of personal identification occurred but a few years since, during the rebuilding of the Church of St. Peter's in the enclosure of the Tower of London. You may remember that in it were buried the bodies of many illustrious persons executed in the Tower some three centuries since, and as it was necessary to disturb the place of their sepulture, Her Majesty gave strict orders that any remains which might be discovered of those persons should, as far as possible, be identified, treated with every reverence, and reinterred in the places known to have been occupied by them, after execution. I was privileged to assist in this examination, and having, many years ago, prepared and published for the Government of Bengal, in English and Hindustani, an illustrated work on anatomy for educational purposes, I had paid much attention to the subject. It was singular to observe, in the careful sifting of the earth in the places of sepulture, that not a particle of the wood or metal used in the coffins was found, whilst some of the bones were in a wonderful state of preservation. Chief among them

were those conjectured to have belonged to the unhappy Queen Anne Boleyn. On arranging those of the head on a sheet of paper, in their natural order, and comparing them with the Chandos portrait of that illustrious lady, it seemed almost possible to reconstruct from them the features of life. Among the bones was an unusually large thigh bone of a woman, the only fragment of her body that was discovered. From the position in which it was found it was supposed to have belonged to the Countess of Salisbury. Those interested in such matters will find all information regarding it in the work of the late Mr. Doyne Bell on the subject.

In France the most successful recent cultivators of anthropology were the elder Bertillon, Quatrefages, and Broca, the founders of the existing School of Anthropology in Paris. The latter, in his learned article on the subject in the "Dictionnaire Encyclopédique des Sciences Medicales," remarks, regarding certain of the methods employed, that in order that the statistics furnished and published should have the value of fixed standards, it is above all things necessary that all observations collected and recorded, should be obtained by strictly uniform procedures. In explaining the contradictory results made known by different authorities regarding, for example, cephalometry, cranial angles, &c., all factors well adapted for statistical use, M. Broca found that the differences were nearly all due to diversity of procedure and different points of departure. It is then, he says, indispensable to adopt for every mensuration a constant and invariable procedure, sufficiently simple to be understood by all observers not possessed of scientific skill. An example known to me of an important fallacy was in the celebrated Professor Tiedeman's plan of measuring the capacity of the skulls of different races, by taking the whole of the interior, with no separation of the brain space from that of the cerebellum.

To the sons of the elder Bertillon is due the application and record of the anthropometric method to the identification of offenders before and after trial, of which the originator is M. Alphonse Bertillon, who has directed its working since its introduction, and his brother Dr. Jacques Bertillon, the chief of the statistical department of the Municipality of Paris, who is its recorder.

The key note to the plan is the perfect identity of a system of individual examination by simple uniform methods, beyond the reach of fancy or fiction, or imperfections of memory or observation. These are applied to certain fixed parts of the body carefully determined, and multiplied by application to a vast number of individuals taken at random, as criminals must

of necessity be. The plan has been worked in Paris with so much success as not to have been attended by a single failure since its introduction in 1882, among the many hundreds to whom it has been applied, as I shall presently endeavour to show you.

Simple as the method now seems to be, its practical application occupied its discoverer for four years with constant study and observation, as M. Alphonse Bertillon tells us.

With this preamble, I shall now proceed to the immediate subject of my discourse, dividing it into two distinct parts, in both of which I can only be the mouth-piece of the authorities whom I shall put in evidence, as much as possible in their own words. Having had no personal knowledge of its working, I shall not attempt to exercise any originality in its treatment, but adhere closely to my text.

The first part will naturally be devoted to the author of the system, whose views were explained and illustrated to the International Prison Congress held in Rome in 1885, and are exceptionally valuable as embodying his personal experience and the steps by which he arrived at his conclusions up to that time.

When there, the system had been comparatively but a short time in effective operation, but the difficulties connected with its working had been satisfactorily overcome. M. Bertillon explained it in detail at Rome, illustrated it, and I have been put in possession of his views, which have undergone no change since, as I have been informed.

My personal knowledge of its working is confined to having witnessed a successful exhibition and demonstration upon a prisoner arrested the previous evening, and at that time unknown to and unrecognized by the department. It occurred during the meeting of the International Statistical Congress in Paris, in October last, and was witnessed by many others at the same time.

I was so strongly impressed with the value and importance of its application to the identification of criminals, with special reference to their antecedents, that I asked Dr. Bertillon if he would give a practical illustration of it in London, which he readily and kindly consented to do.

That he has been unfortunately unable to fulfil his promise,* in circumstances known to you, must be a matter of regret to

* Dr. Bertillon had intimated his absolute inability to come to London for domestic reasons, but he fortunately and unexpectedly put in an appearance on the day of meeting of the Society. I have, nevertheless, left the notes exactly as they were when the certainty of his absence was presumed.

F. J. M.

us all, both on account of its cause and its consequence—a regret of which I think I may fairly take the greatest share, as upon me has unexpectedly fallen a task in which I can but imperfectly represent him and his brother on this occasion

During my long connection with prison administration in India, nothing impressed me more strongly than the need of some unerring test of the identity of habitual criminals, with special reference to their re-convictions and the fresh crimes committed by them. Organized bodies of criminals, some hereditary, and all more or less dangerous, required special agencies for their detection and repression, such as what is known there as the Dacoity Commission, which afforded abundant proof of how important a factor this identification was. Such a means of stamping out gangs of robbers there, and the periodical outbreaks of burglary in this vast city, would in my belief have more influence in rendering it difficult and dangerous to live by criminality as a profession, than any of the sentences passed, and disciplinary measures following them.

The powers of human observation alone are very limited, and the correct recollection of the individuality of persons only occasionally seen, even by the sharpest of our detectives, is so rare, as to fail entirely times out of count when put to a practical test in a Court of Justice. How difficult personation again is to detect, has often been seen, never probably so strikingly as in the case which occupied so much public attention a few years since. Mistaken identity is by no means unknown even in ordinary life, without any suspicion of wrong-doing, as has occurred to myself twice of late years, once in Germany, and a second time in this city. In both cases I had the greatest difficulty in satisfying my supposed friends, on hospitable thoughts intent, that I was not the real Simon Pure. The first was a real comedy of errors, which might disturb the gravity of this assembly were I to relate it.

The discovery and use of photography seemed at one time to afford an infallible test of identification. Although more exact than any other method then in use, it has failed either to be reliable, or on the large scale manageable. Individuals not only undergo subtle changes of feature and form as age advances, and expression, on which so much reliance was once placed, can be so completely changed by a clever culprit, that however completely the fleeting impression produced by any of the instantaneous processes now known can be fixed on the negative, it often fails to secure the certain recognition on which alone absolute reliance can be placed. Yet photography may be and is still, within reasonable limits, found useful—as I found in

so remarkable an instance in New York when I was there in 1881, that I am tempted to relate it to you.

By a trick played upon travellers, and well known in the commercial capital of the States, but at the time unknown to me, I was swindled by an individual whom I had once before seen in England. I obtained an introduction to the Chief of Police to aid me in obtaining restitution, and he referred me to the head of his detective department. This genial Irishman, for he was from the Green Isle, asked me to describe my man. I did so to the best of my ability. He then opened a revolving cabinet containing, if I remember rightly, some 1,600 photographs of persons leading a criminal life in New York, who had been in trouble, and were known to the police. After turning over several of the revolving leaves, he put his finger on a photograph and said "That's your man." I believed he was, so he telephoned for him, and at eight the same evening I saw and identified him, and the next morning full restitution was made to my great surprise and contentment.

The greatest puzzle in identification used to be, and probably still is in this country, the assumption of false names, in the multiplication of which the search through a large number of photographs is perfectly useless. This is said to have actually happened in Paris, when 100,000 photographs have been collected by the police. Photography, therefore is now relegated to a secondary position, and only used as an aid to identification established by other means.

The basis then of the anthropometric system is to obtain measurements of those osseous parts of the human body which undergo little or no change after maturity, and which can be measured with extreme accuracy, to within so small a figure as to be practically exact. These parts are the head, the foot, the middle finger, and the extended forearm from the elbow.

M. Bertillon commenced with a general explanation of the subject, and its special application to the identification of professional criminals, and the detection of the various means adopted to escape recognition. He then detailed his method of procedure, which is embodied in the record of the Municipal Statistics of Paris for 1887, from which I prefer taking it.

He then proceeded to describe the instruments used in the measurements, which will be performed presently.

In his concluding remarks on this head, he showed how rapidly the accumulation of proofs of identification progressed from small beginnings, so that up to August, 1887, 1,500 identifications had been established.

Upon the subject of measurements affording a more reliable

basis for identification than photography, the remarks of M Bertillon are particularly valuable, and deserving of reproduction in his own words. The objection, he says, of the extension to the provinces of this method would be the great cost of organizing a photographic service similar to that of Paris, and he pointed out by what modification of details it could be dispensed with as an essential factor. He pointed out how a vast experience in human physiognomy is required to recognize in many of the photographs which he exhibited, that they are the likeness of the same man taken at different times. Nevertheless, he adds, that those photographs were all taken in the same studio, by the same photographers, with the same apparatus, and as nearly as possible at the same hour in the morning. How much more marked would the difference be, if all these conditions were materially altered.

In this sort of inquiry a photograph in profile is far better than one of full face. The outline of the forehead, the nose, and above all the ear, give an unalterable form. In some, every trace of resemblance had disappeared. Any change in the form of arranging the hair, beard, &c., complicates the matter in adults.

For this, however, the remedy is to place a piece of paper over the hair and beard in both cases, and you have the same face in both. The officials employed in searches, notwithstanding their dexterity, now make use of the figures alone, so that photography is now of hardly any use, and is only employed as a means of check.

Again, some who oppose being photographed, willingly allow themselves to be measured; but their refusal is disregarded. A card without the photograph is classed in the ordinary way, and the man is arrested and comes under another name; the measures are a guide to the card, instead of the photograph.

"We must bear in mind," he continues, "it is not a question of convicting a man because the size of his head, &c., is the same as that of another man. We are simply an office for information. We furnish a name, that is to say, a clue to the investigation. It is for the authority who tries the case to obtain all the further particulars necessary for the trial of the prisoner, in the usual manner. If the information thus provided by anthropometry is confirmed by such additional evidence, the result is absolute certainty for the ends of justice."

For our part, he continues, so certain are we of the correctness of our work, that we purposely refrain from communicating to the prisoners the discovery of their aliases. We only listen to what they say. The search is mostly made when they are not present.

The note containing the information regarding their antecedents, is sent direct from the department to the Juge d'Instruction, who thus makes use of the information regarding the antecedents of the accused, unknown to him, and it aids materially in his proceedings and decision.

At the time M. Bertillon wrote this, there had not been a single error in the 700 notices sent to the judicial courts.

M. Herbette, the General Director of the Prisons of France, from a knowledge of the working of the system, did not hesitate to introduce it in the whole of France, so successful had it proved.

More measurements might have been taken had it been considered necessary, as various other parts of the body would afford different measurements of similar character to those employed—such as the forearm, the length and width of the ear, the height of the bust, the length of all the fingers of the hand, &c.

But when the seven measurements in practice enabled 60,000 photographs to be reduced to series containing 10 in each, further sub-division certainly did not appear to be necessary, or worth the additional cost it would entail.

M. Alphonse Bertillon shows how the further sub-divisions may be obtained from the new measurements referred to above; but nothing in reality can be gained by going beyond the results already obtained, which have proved sufficient for all practical purposes.

Great importance in France is attached in addition to distinctive marks on the person, which are recorded with great care to secure accuracy.

M. Bertillon again advocates classification by ages in decimal periods. He does not, however, himself believe that there is anything to be gained by increasing the number of measurements, or substituting fresh ones for those in use.

The objections to his system urged were also considered in his discourse. Most of these have been answered by the success of his plan, and he is of opinion that it is better to leave it to time, to show what indications may safely be omitted as having been proved to be defective or unnecessary. It is easy enough in such a classification as his to suppress or strike out of the forms in the collection any particulars found superfluous, whilst on the other hand it is manifestly impossible to add five or ten years afterwards additional particulars, when the subjects examined are far away.

The legal aspects of the question of compulsory measurements on untried persons in France, are also considered, but it is acknowledged by M. Bertillon that this must be governed in

every country by its own laws. French judicial proceedings are certainly by no means in accord with ours.

This is a part of the question which I am not qualified to consider, yet whatever will accelerate judicial proceedings in criminal matters appears to me to be deserving of the consideration of the judicial authorities, as well as of the legislature. It is abundantly evident from our police reports, and the constant recurrence of demands for further enquiries as to the personality and antecedents of persons brought before the courts, that some more certain and rapid means of identification are required than those in use, and my belief is that the remedy will be found in the anthropometric method, or such modification of it as may be found consistent with our procedure in all such methods.

In conclusion M. Bertillon discussed the question of its prison and international relations, remarking, I think correctly, that the first step towards reforming a prisoner, rests on a knowledge of his antecedents. In prison, as in a court of justice, are we to treat the habitual criminal and he who has committed his first offence, in the same manner? The concealment of a man's identity entails again a prolongation of his detention before the determination of his case, as most offenders, whether old or new hands, are anxious to know the worst that can befall them as soon as possible, and where the law admits of it, prefer a summary trial to being relegated to the Sessions, not so much from fear of a more severe sentence, as of a wish to be done with it, even if there is a better chance of acquittal with the aid of a jury, and greater clemency of judges. This I was often told by European prisoners in India when released; and they came to me, as they generally did in the absence of any Prisoners' Aid Society, to assist them, either in making a fresh start, or in getting out of the country.

The extension of the method to other countries would aid materially in the detection and punishment of men of different nationalities, who in these days of rapid and cheap locomotion change their venue, and seek new fields in which they are unknown, for continuing their depredations. The remarkable disappearance of English pickpockets from Paris, where their measurements and photographs rendered them easy of recognition, is a striking proof of the advantage of the system. From what was told to me by men who had been imprisoned in England, and re-convicted in India, without any knowledge of their antecedents, some of the decrease in the number of criminals at home may possibly be accounted for.

Upon this point, M. Herbette, the Director of the Penitentiary Department of the Ministry of the Interior in France, remarked at the Congress in Rome, that "Crime becoming in a

certain way professional in the hands of certain individuals who know how to take advantage of the progress of our civilization to escape repression, it is natural that society should utilize the discoveries of science to thwart their devices. The practical application of M. Bertillon's method has entirely fulfilled the hopes inspired by the theory.

"In Paris, Versailles, Milan, Poissy, Lyons, &c., the process was at work in its integrity. A few days had sufficed to teach the warders. In the less important prisons, it is considered sufficient to note in the jailor's register, the cephalic diameters, the length of the middle and third fingers of the left hand and the left foot. These indications are found sufficient to baffle all attempts at falsification of identity. The executive of foreign countries would, on application, be furnished with all information and documents which could assist them in adopting the new method."

He then proceeded to indicate other conditions of life in which it could produce results of extreme value and importance, far beyond the pale of its application to the identification of criminals. But as these are all more or less speculative, it will, I think, be sufficient for the present to limit its application to the field in which it has been so eminently useful, until it has proved to us what it has demonstrated to our neighbours. We are an eminently practical people, although slow to adopt new ways, but we are not slow to see extensions of usefulness when satisfied of their value and applicability.

The Official Report of the Municipality of Paris on the Working of the System to the end of 1887.

History.—The anthropometric identification of criminals was inaugurated in the depôt of the Prefecture of Police at the end of 1882 by Monsieur Camescasse, Prefect of Police, and the Secretary, General M. Val Durand, on the plan suggested by M. Alphonse Bertillon, and submitted to the Administration in 1879.

Since that time, thanks to the initiative of M. Herbette, Director of the Prison Administration of France, its extension to the rest of the country is in process of organization. Ministerial circulars to that effect were issued in November, 1885, and in April, 1888. They are appended to the report of the municipality under review.

Its immediate object was to facilitate the carrying out of the law of the 20th May, 1861, on serious crimes, by establishing a sure and rapid means of the personal identification of relapsed or habitual criminals, and thus to get rid of the constantly

increasing recourse to the assumption of other names of persons known to them, to evade the consequences of a repetition of convictions of crime.

Personnel.—The service of identification of convicts consists of two sections employing corresponding means of investigation: 1st, an anthropometric section, and 2nd, a photographic section. The establishment of each of these sections consists of eight agents, among whom are a brigadier-corporal on the permanent staff of public safety, with a chief inspector having authority over both departments, and a *chef de service* (clerk).

The functions of the anthropometric section are to take a certain number of measurements of osseous parts fixed upon, of persons both in the prisons and the depôt—that is, before and after trial and conviction, and then, using the figures thus obtained as a basis, to class the photographs of those individuals in regular order, so as to render it possible to find easily afterwards, among hundreds of portraits, that of a relapsed criminal concealing his identity under a false name.

Explanation of the system.—Taking as a basis a collection of 60,000 photographs, they would be grouped as follows:—

Photographs of small heads	..	..	20,000
„ „ medium heads	..	..	20,000
„ „ large heads	..	..	20,000

Each of these three divisions of 20,000 would be redistributed, following the same principle, without any reference to the height, into three series, according to the size of the head of each, as follows:—

That of the small heads, 6,000 photographs, and something over.

That of the medium heads, 6,000 photographs, and something over.

That of the large heads, 6,000 photographs, and something over.

These sub-divisions of 6,000 will be divided into three groups, of the length of the middle finger of the left hand, and would then consist of—

Little middle fingers, 2,000 photographs.
Medium „ „ „ „
Large „ „ „ „

The length of the foot would furnish a fourth indication, which would divide each of the packets of the preceding photographs into series of 600, which can be reduced further into smaller elements based on the length of the forearm taken

from the elbow, the length of the little finger and of the ear, the colour of the eyes, and the height of the individual, &c.

Thus, by means of six new anthropometric data (the sex, height, age, and colour of the eyes, having long been in use), the collection of the 60,000 photographs of the Prefecture are ultimately divided into groups of ten, which can be run through rapidly.

It must be added that to maintain uniformity in the figures of such a system of classification in the first instance, and before any measurements are taken, a constantly recurring element is the presumed date of birth, within a limit of twenty years; here the individuals born from 1839 to 1849; next those born from 1850 to 1860, then 1870 to 1889, &c.

Suppose then, we have to verify in the collection, if an individual has not been previously classed under a different name. It is self-evident that, in consulting the division of length of head, corresponding to that of the person under examination, and in stopping in that division at the sub-division of this size of head, to seek afterwards the sub-division of his middle finger, then that of his foot, and that of his length of arm, we shall arrive, by elimination after elimination, at the final packet which ought to contain the photograph sought for—if it has previously been classed, be it understood.

When the figures taken are found to be on the boundaries of divisions, the examination must be made in the adjacent divisions. If several of the measurements are together upon the boundaries, we must take into account the multiple combinations to which such researches must give rise.

Anthropometric classification.—The qualifications—small, medium (mean), and great—of each successive elimination, are rigorously determined by figures. In order that the quotients thus obtained be approximately equal, it is absolutely necessary that the numerical limit of the category medium (or mean) should be more restricted than the categories small and great. Suppose, for example, we begin our eliminations with the height, the figure of middle height should contain all individuals of 1 m. 62, to 1 m. 67, whilst the great would extend from 1 m. 68, to the giant of two metres, and the small height to Lilliputians of 1 metre and a few centimetres.

The division of the binomial curves shows that to realize this condition in a general way, the limits of the medium category must not deviate above or below the arithmetic mean, beyond 63 hundredths of the probable error.

It is self-evident that the arithmetic mean of each measurement varies according to the branch (little, mean, or great) of the preceding measurements.

He then proceeds to explain the mode of arrangement of the photographs in the cupboards in triple divisions for readier reference and search; but, as it could scarcely be rendered intelligible without a diagram or a model, I do not reproduce it. It is extremely ingenious, and the plans would, I am sure, be readily supplied to any authority asking for it.

Photography.—The photographic proof added to these beforementioned is a profile of the right side, and one of the full face slightly turned to the right, the two to an exact scale of one-seventh. The proceeding is now, however, considered of secondary importance, and is used only as a further test to secure absolute accuracy.

Particular marks.—All evidence of scars, moles, or characteristic indications of any kind are recorded on the backs of the photographs with anatomical precision as to their nature, dimensions, situation, &c. Much importance has always been attached to some of these.

Certainty of the process.—The three recognitory elements of identification, independent each of the other, are:—

1. Mensuration.
2. Photographs (profile or full face).
3. Record of cicatrices (scars).

When taken together they control the identity of an individual for many years with absolute certainty, to such an extent that the employés of this service, when they discover the real name of a culprit concealed under a false account of his civil status, are enjoined not to communicate this result to the offender, but to send the information direct to the proper judicial authority, who thus becomes forearmed as to the real identity of the person, without his knowledge.

On more than 2,300 recognitions thus furnished up to April, 1889, not one has led to confusion, which would at once have been made known, by the accused to the magistrate.

Operations effected.—The undermentioned figures being the annual total of individuals recognized to have been personally examined under another "*état civil*," show the constantly increasing extensions of the operations of this service.

Years.	Number of persons examined.	Number of relapses recognized under false names.
1882	225	—
1883	7,336	49
1884	10,308	241
1885	14,965	421
1886	15,703	352
1887	19,140	472
1888	31,849	615

The figures 31,849 in the year 1888 represent nearly the whole number of persons arrested during this period for offences under the common law, and having passed through the depôt. The *personnel* actually assigned to the service allowed of the extension of the measurements to the 100 arrested, the average number passed through the depôt every day.

To work rapidly requires that the measuring agent should have the aid of an assistant, to whom he could dictate the figures without leaving his measuring instruments.

Thus worked by two persons, the measuring of an individual takes two minutes, the examination of the cicatrices, or other marks, including tattooing, &c., three minutes, the inscription of the surname and *prenomen* (Christian name), age, &c., on the declaration of the subject, two minutes. Total for the whole operation, seven minutes, or eight persons in an hour. If carried on without interruption from 9 a.m. to midday, two agents could complete 24 operations ($8 \times 3 = 24$).

Four squads of two agents were sufficient to complete 100 examinations before midday. It is necessary so as not to interfere with judicial proceedings that the examinations should be completed before the opening of the offices and the courts.

The afternoon is sufficient for the copying of the documents for all official purposes.

It is stated that the habitual offenders have learnt by their personal experience or by the prison talk, that the time for aliases has passed away. Now-a-days it often happens that those confined under false names and measured previously, correct their civil status of their own accord, when they find they are to be taken to the measuring room. It has likewise appeared to us to be useful to add to the descriptive roll for the special registration of this kind of rectification :—*Individuals recognized to have been previously measured under the same name.* This number actually exceeds those identified by other means. Prevention is better than repression.

It is also found better to postpone the examination to the day after incarceration, that they may have a night for reflection on their position, and to recast their identity to the registry office of the depôt, should they be so disposed.

So that it may be said that the forty recognitions made every month by the identification department could not have been made by another procedure, and they correspond to the number of individuals who, before the establishment of the system, succeeded in passing before the tribunal under their false *état* civil (default made of rectifications which have always been raised by the magistrate's instructors, but enquiries of this

nature could not be made anteriorly without cost, and without prolonging considerably the time of enquiry).

Another proof of the efficacy of the system of anthropometry is the complete disappearance of dissimulation of identities in the prisons, other than the depôt, so that whilst in 1884 and 1885, the number of recognitions made in the prison *after conviction*, amounted to 200 or 300 a year, the number of cases of this class in the whole year 1888 was fourteen, of whom ten were of individuals who never having been measured before, were of necessity not recognisable by the service. This leaves four omissions to be distributed among the 31,000 examined in the year.

Motives for change of name.—These among professional or habitual criminals are usually taken to avoid increased severity of sentence on conviction, and in France by deserters from the army or refractory soldiers, who, arrested for a trifling offence, are particularly anxious not to be made over to the military authorities.

The equivalence of recognition on the ground of general interest, is that the arrest of deserters, escaped prisoners, persons convicted by default, is as useful as would be the direct arrest of any of the classes above-mentioned.

The category of evil-doers who most frequently resort to aliases are those most given to indulging in changing of names. In the front rank must be placed the professional thieves of the Anglo-Saxon race, known as pick-pockets. All the individuals of this species, without exception, who have been measured by the department who have since returned, thought it expedient to change their first status: a remarkable result is the number of this sort of thieves has increasingly diminished since the creation of the service of identification; from 65 in 1885, it fell to 52 in 1886, to 34 in 1887, and to 19 in 1888. Having assured themselves that it was impossible for them to conceal their antecedents on arrest, they prefer now, according to their own avowal, new pastures in foreign capitals. [Some of you may remember the amusing examples of pocket-picking in Paris, given by Bulwer Lytton in his novel of "Pelham." The Celts are clumsy apprentices, the Anglo-Saxon past masters in that craft. It also reminds one of the inimitable portraiture by Dickens of the renowned Fagin.]

Sometimes names are changed to prevent disgrace falling upon the family. I was acquainted with many such cases in Calcutta, particularly the poor fellows who died in my hospital, and wished me to communicate their deaths to their families.

The remainder of the official report from which I have

borrowed all the particulars above noted is devoted to the consequences possible upon the generalisation of the system.

In introducing his remarks on the tables Dr. Jacques Bertillon mentions that, before anthropometry was applied to police purposes, it had been utilized in the solutions of some of the problems which belong as much to mathematics as to natural history.

The Anthropological School in Paris, founded by his father and Professors Quatrefages and Broca, as I have already remarked (for they were all known to me personally) extolled it as a valuable means of investigation in studies of the races of mankind, of the hygiene of infancy, &c. The new theories of the Italian criminalists are, in many points, based on osteometric observations.

These considerations have induced me to summarise in the appended tables the anthropometric documents accumulated in the archives of the service of identification.

We hope they will furnish anthropologists interested in these questions with facts of undisputable accuracy. To this advantage will be added that of furnishing the elements of the mathematical theory of the anthropometrical method, and show on what data we work.

The tables, five in number, are the outcome of the observation of 8,365 persons born in Paris. There is thus, as far as possible, unity of origin. I could scarcely explain the exact nature of these tables intelligibly, but I venture to suggest that they may be published in the Transactions of the Institute should they be deemed fit.*

Conclusion.—I have now placed before you, *tant bien que mal*, I hope an intelligible account of the anthropometric method of identification of criminals, which has now been in use in France for several years, is extended to the whole of that great country, has already been applied to many thousands of persons, and in the 2,300 cases in which efforts at concealment were made, with all the proverbial cunning of the criminal classes, has stripped off the mask of imposture without a single failure. The method is simple, easily learnt and easily applied, can be accomplished with the intelligent agency always at the command of prison and police authorities, and by the facility and rapidity with which its results can be made available for use when needed, prevents the vast accumulations of the materials of identification from overwhelming the searches of records, in a manner never yet accomplished by any other method employed. It dispenses effectually with errors of observation, treachery of memory, the unavoidable fallibility of human testimony, even

* The tables are omitted, as they were too voluminous.

when honestly given, and employs strictly scientific methods, devoid of all cruelty, humiliation, and even harshness. The testimony of those parts of the human organization, which are most permanent in their character, and cannot be falsified or changed by any devices of the offender, is surely an unmixed gain to civilisation, and among the most effectual checks to the adoption of a career of crime, as it is the certainty of detection, rather than severity of sentence, which most deters the habitual offenders.

That well-known humorist, and singularly keen and accurate observer, the late Sidney Smith, in speaking of crime and criminals, declared the most vulnerable part of a thief to be his belly. Had he been alive now, I think he would have changed his view, and declared that the most honest part of a thief, or a rogue of any category, was his bones, for he could by no ingenuity however subtle, cause them to lie, when the truth of his identity was in question, and was of use to the cause of justice in dealing with him.

Discussion.

Sir Rawson Rawson, after Dr. Bertillon's demonstration, expressed his appreciation of the very interesting communication which had been made to the Anthropological Institute, and referred to the trouble which Dr. Bertillon had taken in coming over from Paris expressly to attend the meeting. He remarked that Dr. Bertillon only arrived in London at 6 p.m. that evening, and that he had scarcely recovered the stability of a philosopher after a rough sea voyage, when he delivered his address.

Dr. Bertillon had mentioned that the speaker had had an opportunity of personally testing the practical use of the method at the general meeting of the International Statistical Institute, held at Paris last year. A brief description of Sir Rawson Rawson's experience on that occasion might be of interest to the meeting.

One afternoon the Institute adjourned to the Palais de Justice, where, under the conduct of Dr. Bertillon, a prisoner was brought in who had been arrested on the previous day. He had given a false name, and declared that he had not been previously in the hands of the police. In our presence, said Sir Rawson, a prison warder took the several measurements already demonstrated by M. Bertillon. This occupied five or six minutes. I was then taken into the adjoining chamber, in which the cards containing the record of the 100,000 prisoners already measured were arranged in drawers and sub-divisions in the manner described. In the first I found a tray of cards in which the two principal measurements agreed; they were very numerous. Under that was a tray in which a third measurement agreed; they were less

numerous. I then saw trays in which a fourth and fifth measurement agreed, and either in the fifth or sixth, in which the number had become quite small, ten or twelve. I found one in which that large number of agreements was observable, and on the reverse were the photographs—full face and profile—by which the identification of the prisoner was completed. On being shown the photograph he acknowledged its identity, and gave his real name. On referring to his prison record, M. Bertillon showed that he was an old offender in another sphere of criminality.

My examination of the cards occupied even less time than the measurement of the individual.

Sir Rawson Rawson, in conclusion, expressed his belief that the method recommended by M. Bertillon was both easy and effective, and that it might be introduced with great advantage in the United Kingdom.

Mr. Francis Galton remarked that it was gratifying to learn from the interesting account they had just heard that the Bertillon system had stood the test of experience so well that its application was extending; also that the variety of features found suitable for measurement or for description was continually increasing. Its growing importance in France, its employment, as we were now informed, in the United States, and even, as he believed, in the Argentine Republic, were evidences of its extension. The investigation of the callosities acquired by artisans in the practice of their several labours, and the marks left on their hands by the tools they habitually used, were instances of recent additions to its processes. There may be room for reasonable doubt among anthropologists whether the precision with which the living body can be measured is quite as great, and whether its dimensions are quite as permanent as they are considered to be by M. Bertillon; and again there may be some hesitation in believing that a very large collection of measures would admit of being so surely catalogued on the Bertillon system as to be ransacked with a promptitude at all corresponding to that with which a word may be found in a huge dictionary. Nevertheless there can be no doubt as to the truth of the main ideas upon which the system is founded, namely, that individuals differ largely and for long periods of their lives, in very many separate particulars, some of which admit of direct measurement, and others of being described, with a considerable degree of accuracy, and that these measures and descriptions admit of being catalogued and classified by the ingenious Bertillon system in a way that vastly diminishes the labour of search for any particular set of measurements; also, that the anthropometric system adds vastly to the precision with which the identification of a person may be established.

MAY 13TH, 1890.

J. G. GARSON, Esq., M.D., *Vice-President, in the Chair.*

The Minutes of the last meeting were read and signed.

The election of the following gentlemen was announced:—

STANLEY EDWARDS, Esq., F.Z.S., F.R.G.S., F.E.S., of Kidbrooke Lodge, Blackheath.

W. SCOTT LANE, Esq., M.D., of the Royal College of Surgeons, Edinburgh.

The following presents were announced, and thanks voted to the respective donors:—

FOR THE LIBRARY.

From DR. F. J. MOUAT.—H. Busch's Journal of a Cruise amongst the Nicobar Islands.

From the U.S. GEOLOGICAL SURVEY.—Seventh Annual Report, 1885–86,

From BARON A. VON HÜGEL.—The Nanga of Viti-Levu. By Mr. Adolph B. Joske, Fiji. With Plate xvii. Note by Baron von Hügel.

From the AUTHOR.—Notes on the Pearl and Chank Fisheries and Marine Fauna of the Gulf of Manaar. By Edgar Thurston, C.M.Z.S.

From the ASSOCIATION.—Proceedings of the Geologists' Association. Vol. xi. No. 6.

From the ESSEX FIELD CLUB.—The Essex Naturalist. Nos. 10-12. Vol. iii. Nos. 1-3. Vol. iv.

From the INSTITUTE.—Proceedings and Transactions of the Nova Scotian Institute of Natural Science. Vol. vii. Part iii.

From the ANTHROPOLOGICAL SOCIETY OF WASHINGTON.—The American Anthropologist. Vol. iii. No. 1.

From the ROYAL SCOTTISH GEOGRAPHICAL SOCIETY.—The Scottish Geographical Magazine. Vol. vi. No. 5.

From the YORKSHIRE PHILOSOPHICAL SOCIETY.—Annual Report. 1889.

From the SOCIETY.—Proceedings of the Society of Biblical Archæology. Vol. xii. Part 6.

—— Proceedings of the Royal Geographical Society. Vol. xii. No. 5.

—— Proceedings of the Royal Society. Vol. xlvii. No. 288.

—— Journal of the Society of Arts. Nos. 1953–55.

—— Société de Borda, Dax; Janvier-Mars.

From the SOCIETY.—Mittheilungen der kais. königl. Geographischen Gesellschaft in Wien. 1889.
From the EDITOR.—The American Antiquarian and Oriental Journal. Vol. xii. No. 2.
—— Science. Nos. 376, 377.
—— Revue Scientifique. Tome xlv. Nos. 17–19.
—— Bullettino di Paletnologia Italiana. Tomo vi. Nos. 1, 2.

MR. G. F. LAWRENCE exhibited two human skulls recently dredged up from the bed of the Thames.

MR. A. P. GOODWIN exhibited some fire-sticks from New Guinea, and made some observations on the Natives encountered on Sir William MacGregor's expedition to Mount Owen Stanley.

MR. FRANCIS GALTON exhibited a new instrument for measuring the rate of movement of the various limbs, and read the following note:—

A NEW INSTRUMENT *for measuring the* RATE *of* MOVEMENT *of the various* LIMBS.

By FRANCIS GALTON, F.R.S.,

Vice-President Anthropological Institute.

[WITH ZINCOGRAPH.]

DIFFICULTY has been found in making courses of experiment on the rates of muscular movement in different persons. This is partly due to the tedium of observing with a blackened cylinder and a vibrating tuning fork, or with a broken electrical current and a Hipp's chronograph, or other apparatus of the kind. More especially is it due to the violence and to the somewhat uncertain direction of the movements to be measured.

In the laboratory that I set up in 1884 in the International Health Exhibition, the instrument used for the purpose was a stout sliding bar, struck forward by the fist. As soon as it started, it released a fixed spring that had been deflected to one side, and which thenceforward vibrated across the bar. A pencil attached to the free end of the spring, left a sinuous trace on the bar, and the number of bends in the trace in any space was proportionate to the time taken by the bar to travel through that space. By using an appropriate scale the absolute mean velocity during any given period was easily read off.

But it proved that few persons delivered their blow in a straightforward manner. They usually struck the deal bar to one side and often broke the apparatus, and when I replaced it with a bar of harder wood, they still broke it, and hurt themselves rather severely at the same time. Experience showed the necessity of eliminating this difficulty and danger. Whatever may be the violence or the direction of the blow, the recording apparatus should be safe, and the person tested should be unable to injure himself.

The method adopted in the present design is perhaps most simply explained by referring to the action of a spring measuring tape. When the end of one of these is pulled out and then let go, it springs sharply back, the tape running cleanly through a slit. Suppose for a moment that it runs back more quickly than the hand could follow it, then, if the end of the tape is retained in the hand that gives the blow, the tape will run through the slit at the exact rate at which the blow is given. It cannot go quicker, because the hand retards it; it will not go slower, because the spring urges it on. The hand need not be near to the tape; it may be connected with it by a long thread, and the action of the apparatus will remain unaltered. The instrument then would be quite out of reach of harm. In this way, a violent movement full of danger to most instruments is translated into a swift movement of a mere thread, running smoothly between eye holes in a straight line.

Having thus got a thread moving smoothly with the same velocity as the arm, the next question is how to measure that velocity. I do it by gravity. The thread during part of its course is arranged to travel vertically, and passes through a small inverted cone, to which it is fixed. The thread then passes loosely through a cylindrical bead of white ivory, whose bottom rests on the face of the cone. When the moving thread is suddenly arrested, the bead is tossed up to a height dependent on the velocity of the thread at the time when it was arrested. The momentary pause of the white bead, after it ceases to ascend and before it begins to descend, enables the height it has attained to be easily read off, upon an appropriate scale, which tells at how many feet per second the string was moving at the instant before it was checked.

The instrument that I show has worked well, but doubtless admits of much improvement in detail. It is exhibited in its present early stage for the benefit of criticism and suggestions.

The proportions of the instrument have been guided by the fact that the issuing thread must be at about the level of the shoulder, and that the scale must be opposite to the eye of the experimenter. It was also thought best to arrange the scale so

as to show velocities between, about 5 feet and 30 feet per second. To do this, and at the same time to keep the scale of a convenient size, the velocity of the bead must be mechanically reduced to a fraction of that of the free end of the string. In my instrument I have reduced it to one-third. This being premised, the principle of the machine is here shown in diagrammatic form. In the actual machine there are some differences of detail, and an adjustment is added for readily bringing the bead to the zero position, when the machine is at rest. A piece of thin pianoforte wire is interpolated for the bead to run on, and the check is given by a small india-rubber ball on the string striking home against a fixed cork buffer. It is not of the least consequence that the check should be sharp; all that is necessary is that its motion should *begin* to be checked when the bead is at zero. Then the bead leaves the cone, and henceforward behaves as a free projectile.

We must satisfy ourselves that the spring can pull the thread more quickly than the arm can follow. This is easily done by seeing that the ball is tossed up considerably higher, when the string is allowed to run home unrestrained, than it does when it is held in the hand that delivers the blow.

I find considerable regularity in the readings, when the conditions under which the blow is delivered are similar, but a small alteration in those conditions may make a considerable alteration in the results. It is remarkable how greatly a movement of the wrist may increase the velocity of the hand. We see an effect of this kind in a thrown ball, which travels vastly quicker than the wrist of the hand that throws it. The question of the best measures to take, and the best conditions under which to take them, deserves careful consideration, and I should be grateful for suggestions. One good test position seems to be, to stand behind, and slightly pressing against a horizontal bar that lies lower than the elbow, to plant the feet in chalked spaces, the left foot parallel to the bar, and the right foot pointing to the front, then reaching forward as far as the bar conveniently permits, to seize the tightened string and to draw it back to the vertical post to which the bar is fixed, and from that position to deliver the blow.

For calculating the scale, let v = the velocity of the cone in feet per second at the moment before it is checked at the zero point, and s = the height in inches to which the bead will be tossed, then $s = v^2 \times 0{\cdot}186$ inches. By giving successive values to v the scale is easily calculated. As in my instrument v is only one-third of the velocity of the arm, we have to calculate for values of $v = \frac{10}{3}$ feet per second, $\frac{11}{3}$ feet per second, &c., in order to find the height to which the bead will be tossed, when

the velocity of the arm is 10, 11, &c., feet per second, and these latter figures must be inscribed as the calculated heights. The actual velocity of a blow being taken at 20 feet per second, the difference on the scale between it and 21 feet per second, is then the difference between 8·28 inches and 9·13 inches, or nearly an inch, an ample and convenient interval. For calculating according to this scale, if w = the velocity of the arm, $s = w^2 \times 0{\cdot}0207$.

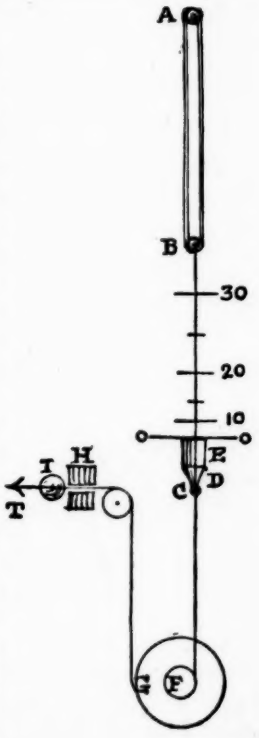
I had hoped to have given more definite results in this paper, but accidental delays in the completion of some carpenter's work have prevented me. Perhaps I may be allowed to add a foot-note before these notes are printed, if there be time and opportunity to do so.

Description of the Figure.

AB. A stretched india-rubber band.

BC. Thin steel wire, upon which the ivory cylinder E runs loosely like a bead. The end of BC passes through an inverted cone D, into which it is fixed.

F, G. Are two grooved wheels fixed together, and turning freely on a common fixed axis. The diameter of F is one-third that of G. A thread passing from C is wrapped a few times round E, to which its other end is fixed. Another thread fixed to F is wrapped a few times round F, and is then carried, first vertically upwards, and afterwards horizontally, by passing over a grooved wheel. It then passes through a hole in a fixed buffer H. On the other side of H it passes through, and is attached to a small india-rubber ball I.



When the machine is at rest the tension of AB causes I to be pressed home against H. When T is drawn out, AB stretches further, D descends, and the cylinder E descends with it. On delivering a blow with the hand that holds the free end of T, C ascends up to the point at which

the top of E is brought level with the zero line. There C stops, owing to I coming in contact with the buffers H. Consequently the ivory cylinder E is tossed up as a free projectile, and the graduation to which it ascends is noted. The number attached to that graduation shows the number of feet per second at which T was moving immediately before its motion was checked.

NOTE, OCTOBER 17.—The instrument has worked regularly at my laboratory after a little experience had suggested some minor amendments in detail. The chief of these was to greatly lengthen the elastic band, by passing it over a pulley at the top and bringing it thence downwards to the bottom of the frame. This greatly increased the uniformity of the strain and it makes the action very smooth.

The person experimented on stands with his back to a wall and strikes at the end of a long feather so placed that when the fist reaches the feather the india-rubber ball strikes the buffer. Care is taken that the wrist does not bend. I have not as yet worked up the results. The machine was made for me by Groves, 89, Bolsover Street, W. F. G.

Dr. G. W. LEITNER delivered a verbal address, of which the following is an abstract by Mr. A. L. Lewis :—

On the ETHNOGRAPHICAL BASIS *of* LANGUAGE, *with special reference to the* CUSTOMS *and* LANGUAGE *of* HUNZA.

By Dr. G. W. LEITNER, Ph.D., LL.D., &c.

DR. LEITNER, in commencing his address, referred to his communications to the Anthropological Society in 1869, respecting the first results of his enquiries in Badakhshan, and to the Ethnological Society in 1870, when he brought to the meeting his Yarkandi, Niaz Muhammed ; and also to his communication to the Anthropological Institute in 1874, when he introduced to it Jamshêd, the first Siah Posh Kafir, a supposed blue-eyed descendant of the Macedonian colonists in the Hindukush, who had visited this country, and who, having since been sent back to his own country, had returned to Europe, and had died fighting against the Russians in the Herzegovina. The speaker said that he had wished to introduce on the present occasion a member of

another race of Dardistan, a Hunza man, but was unable to do so in consequence of his being too much of a savage. The *Illustrated News* had given a picture of him in front of the mosque which the author was building at Woking. There was no chance of making him a really good Muhamedan (the only religion of which he might be got to form a conception); he had been engaged in kidnapping people, but as there was nobody here for him to kidnap, he had become very unhappy, and Dr. Leitner thought it a good riddance when he wanted to go on a pilgrimage to Kerbelá.

The subject immediately before the meeting was one of very great importance. The author had pointed out at a previous meeting that the time was long past when grammatical rules and laws were solely to guide them in the study of language, and that, as the East was brought nearer to them, it would force upon them more and more the necessity of treating languages as living and not as mummies; some reputations might suffer in consequence, and great men who now talked *of* fifty languages might have to be content with knowing one; but it was very necessary that a study of the customs, history, and associations of races should accompany the study of their languages. In the Hunza language especially, which some had thought to be a remnant of a prehistoric language—the formation of words ran concurrently with some of the earliest conceptions and simplest relationships; how far this would upset or support the theories of Indo-Germanic, or Turanian, or Slavonian cradle-lands, it was impossible to say at present. When Dr. Leitner first brought the materials of the Hunza language home he was told by Professor Weber that he had not shown that it was of earlier date than Sanskrit; he was very sorry for it, but the language could only be what it actually was, and he thought there ought to be a division of labour between those who collected facts and those who speculated on them, and that it was for the Germans, who had elaborated so many conjectures, to elaborate one regarding the Hunza language. Something had indeed been recently elaborated at Munich, but it was a curious instance of learning apart from facts. Dr. Leitner's great aim was to show what a language really was, for there were plenty of scholars in Europe who could point out what it ought to be. Real discovery was to find what existed or was done in a particular place, and to bring back a report of it without favour to any particular school, and to place it before that small part of the public which took an interest in the question. They had an instance in the Hunza of the growth of simple sounds into what in Aryan philology were called roots. If he might borrow an illustration from the English or French he would say that, if they had a

word like "mother," *m* would mean the female element, *o* would be the self, and *ther* would mean the tribe, indicating a state of endogamy in which all grown up females were considered to be mothers, and all grown up men fathers of the tribe. In the same way, sounds indicated a number of customs in that particular race, but of course it was when similar principles were applied to cases nearer home that the results were most startling. Thus, in French, "parents" meant father and mother, and also relatives, just as in Hunza all female relatives were mothers, and all mature men fathers of the tribe. If he were asked what had been done during the years that the subject had been under research since he first brought it before them in 1869, he would say the net result had been favourable to this country, in so far that those countries to which even the collective name of "Dardistan" had then to be given by him, were now brought under British influence. The rulers of those countries were very favourable to him personally, and had welcomed other travellers on his account. It is true, one traveller, Mr. Hayward, was killed, but that was because the Government had neglected the information Dr. Leitner had given, warning him against a certain chief; but, on the whole, these tribes, which had falsely been said to be cannibals, had given a friendly reception to a Government Mission that had followed in Dr. Leitner's footsteps twenty years later, and had followed his advice regarding the spiritual chief of the Hunza sect, who, curiously enough, resided at Bombay. The Dard races were now largely under our influence, and he hoped we should be content with that, because absorption would emasculate them, and render them incapable of defending themselves against Russia, while, if Russia were now to occupy their country, or if we were to attempt to divide it between ourselves and Russia, the resistance offered would be equal to that offered by the Circassians.

In opening up the country to British influence, Dr. Leitner said he had not done so with the view to encourage trade; indeed he had not even mentioned where gold was to be found. The Buddhists thought that the best place for gold was under the earth, because when it was brought to the surface it let loose a lot of bad passions, and therefore the Tibetans were anxious to keep us away. Leaving aside mining or washing for gold, there was no specialist of any kind who would not be rewarded if he turned his attention to the Hindukush.

Returning to the Hunzas, there was one thing which was not common further south—the great influence women had in determining their policy. The Rajah, being supposed to be heaven-born, none but an inspired woman dare tell him the truth. These women would get in a state of ecstasy, and recount

the glories, such as they were, of the past, and prophesy as to the future, and nothing was undertaken without them. If time had permitted Dr. Leitner to go into details, the members of the Institute would be astonished to find how many of Grimm's "Fairy Tales" were translated into daily life in Hunza; but it was none the better for that. There was constant drunkenness even in the mosques, and from the parricides and fratricides that went on, it seemed very awkward to be a relative of anybody there; in fact, it was extremely awkward to be there at all; but for all that, it was a very interesting country, and would amply reward the attention of any member of the Institute. They had a book, of which a Chief had given him a few pages; it was a kind of mystic poetry in a quaint Persian style—so far as the contents were concerned very like some of the writings of the Druses of the Lebanon. The Druses had a sacred covenant of a most unholy nature, not with the deity, but with Hakim, the mad Fatimite ruler of Egypt. The Hunzas one with their "Lord of the Universe," the lineal descendant of the 7th Imam, who lived in Bombay. It was very singular there should be this coincidence between these two peoples. The fundamental idea of both these covenants was the belief in transmigration—that all life is one, and cannot be divided, and that it depends on the character and the predominant elements in a person whether in his future lot he shall return to one element rather than another. These affirmative propositions were, however, framed in such a manner as to make it appear that they simultaneously denied them, for they say, "if you are asked a question of the folly (of religion), reply in this manner," as if saying even so much ought not to be revealed to the uninitiated.

The points that would particularly commend themselves to the Institute that evening were that the study of language could not henceforth be dissociated from the customs, antecedents, and associations, the natural phenomena surrounding, and the history of, the people speaking it. Even with highly civilized languages like Arabic this was the case, for that language had a great number of plurals expressing different circumstances, as, for instance, with regard to camels, whether they were straggling in a line, or were gathered in a circle round a tent, &c. It was better, therefore, to learn the customs of a people, and thereby to gain a knowledge of the language, which would be lasting, because based on living associations, than to learn the language simply as a matter of memory. Professor Max Müller had said the other day that he thought no man could speak more than two or three languages perfectly; this was true, and yet untrue. Those who studied in the way he (Dr. Leitner) had indicated, would find that they could exchange thoughts with others in

many languages, but those who only dabbled in two or three languages did not really know one, nor would they know all the technical terms of one, and, in any case, would be unable to communicate thoughts if they had not the thoughts themselves; therefore the statement he had referred to was partly true and also partly untrue. It was possible to learn a great number of languages if they would emancipate themselves from the tyranny of the present philological school, but they must be studied as living languages, along with the customs of those who spoke them, and not as if they were mummies.

He had taken the liberty of analyzing the Arabic and Sanskrit of our great scholars, and found them very unlike the Arabic and Sanskrit spoken by those who had the living traditions. The East was coming too near to be played with, and it was to the study of it that he would particularly desire the Anthropological Institute to address its attention; it was upon the lines he had indicated that, while availing themselves of all the treasures of the existing schools, the greatest discoveries would yet be made, and on those lines he hoped to become, in conjunction and in co-operation with the members of the Institute, he would not say a perfect scholar, but a more successful student.

Discussion.

Mr. Hyde Clarke, who was unable to be present, wrote as follows:—I was very sorry not to be able to attend the discussion on Dr. Leitner's discourse. It is now about twenty years since I first discussed the subject of these interesting regions with Professor Leitner, and I know that he has continuously and laboriously pursued his researches One point of contact was with regard to Khajunah, on which he had accepted from Dr. Latham a statement at p. 250 of the "Elements of Comparative Philology," of the juxtaposition of Khajunah with Shina and Arniya. I directed his attention to the true philological interest of Khajunah. On remonstrating with Dr. Latham on his representations, he made the excuse for this and other examples of carelessness that this book, and not this alone, was "a pot-boiler." This book is, however, a remarkable work of labour and of reference, even to this day, but Latham, with great abilities, was little careful of literary obligations. His edition of the "Germania" of Tacitus is really a transposition of the materials of Zeuss in his "Germania." He had no true eye for language, as anyone can see in the instance of p. 250, and like many men he was a philologist of the eye, and not of the tongue and ear. This marks the contrast with Dr. Leitner, who has not only the book knowledge of scholastic learning, but the genuine power of a great linguist in acquiring languages from the living sources. As he unites with this the knowledge and

capacity for studying the anthropological relations, his labours in the Himalayas, of which those with regard to Hunza now referred to are only a portion, are of the greatest importance. Thus his are not only observations, but discoveries, and it is earnestly to be wished that he may pursue his investigations to the full. Availing himself of the peculiar frontiers for such studies as Lahore, like Cardinal Mezzofanti did of the College of the Propaganda at Rome, Professor Leitner has passed under observation the languages and idioms, the jargons and dialects of trades and of wandering tribes in India and the Himalayas, to the great profit of science and the great benefit of our Government. He was in India a centre of constant reference. Once, when ill in bed at Lahore with fever, a chief of police brought, under orders from the Government, five men before him in custody, whom it was desired to identify, as they were suspected of being Russian spies. Having caused them to be released and seated round his bed, and given them refreshments, he proceeded to converse with them, and to establish some basis of confidence. Two of the strangers knew a little Persian, which made a rude channel of communication. They stated that they were Mussulmans, who had been taken by the Russians on the capitulation of Kars, transported to Siberia and kept in captivity for many years, until they had made their escape to Afghanistan after great difficulty. He then proceeded in an endeavour to identify them, and asked them as to their habitations and language, and they stated they were Lesghians of the Caucasus. Fortunately, Dr. Leitner remembered a paper of mine before the Anthropological Institute, in which Lesghian was referred to, and which enabled him to test their statements. On his recommendation the wanderers were passed on by the Government to Bombay, and so as near to their country as it was possible to proceed, joining probably Caucasian refugees in Turkey in Asia. Few are able to understand and to appreciate the scene of Dr. Leitner's labours, and the nature and value of them. Our general conceptions of a region in ancient times, and in the present day, is that it is an area chiefly of one dominant language. Caucasia with its many languages appears to us to be an exception; in fact, it is not so, but the Himalayas are under these conditions, and many parts of the world. Such indeed was the primitive nature of these continents before the great epoch in history of the invasions of the Semitic languages, and of the Indo-European, which ate up and swallowed the mass and variety of the indigenous languages and dialects. Hence the necessity of these investigations of Dr. Leitner for ascertaining the real nature of the Himalayan linguistics, and their relation to the origins of Aryan. If what he has done for the dead languages particularly touches this subject, no less pertinent are observations on the Turanian languages of the mountain mass, made known to us by the assiduous work of Brian H. Hodgson and others. Schoolmen have facile methods of determining the origins of the Aryans and their languages, and some of the Sanskritists have favoured us with an imaginary

aboriginal Sanskrit. Their doctrines do not supply us with an explanation of the rude and outlying languages of Kaffiristan, Dardistan, Afghanistan, Armenia, Albania, &c. The present state of affairs has led to a revolt against the domination of the Sanskritists in Germany by the new school of philology, under Professor Carl Abel and others, and an attempt by seceders from the sect of Sanskritists to change the *habitat* of the primitive Aryans from the Himalayas and Central Asia to low lands on the Baltic, suitable for the beech and birch. The conditions of the ethnographic and the linguistic problems are very complicated, and they require for their solution the labour of many men like Professor Leitner. In the Himalayas, as stated in a paper on the "Himalayan Origin of the Magyars," before this Institute, I attempted to establish relations of the Magyars, and of tribes, who co-operated with the Germanic and Magyar invaders of Western Europe, historical incidents, which are not exceptional in ethnographical annals, but not sufficiently studied.

Dr. LEITNER, in reply to observations made, said he had at first thought the Hunza language was Turanian, though that term was very vague, and was made to include all languages they knew nothing about, but he now, on further analysis of it, thought it might be taken to be the language out of which the earliest Sanskrit may have diverged. There was, however, a great difficulty in finding out the meanings of words, as "*ák*" would mean my name, "*guk*" thy name, and "*ik*" his name, while the consonant without the vowel had no meaning at all, so that the pronoun was mixed up with the substantive in such a manner that the substantive, relating to a person, had no separate existence, and this was also the case with the prepositions. "His finger" and "my finger" would be different words, and to follow up the language required a process of dissociation which was very difficult; but what did it lead to? They had reached a language in which a number of simple sounds stood for a number of relationships—the female relationship in various gradations and other personal relationships being represented by simple sounds. It was very difficult to say whether this was a Turanian language, but he thought it would turn out to be the language from which the Aryan languages had differentiated.

On Some Borneo Traps.

By Sydney B. J. Skertchly, F.G.S., M.A.I., &c.

[with plates iv to x.]

[Read February 25th, 1890.]

The following descriptions were written and the accompanying sketches made in the jungle of North Borneo. The traps were made for me by my own Dyaks, some for the purpose of illustration, some for the purpose of filling our scant larder.

The words, whether Dyak or Malay, are spelt phonetically, and the meaning given whenever it is known to me.

I. The *Jerat.* (Plates IV and V.)

The *Jerat*, Figs. 1 and 2, is a spring and noose trap of universal use amongst Dyaks and Malays in the forest. The word *jerat* with slight modifications is known far and wide through the archipelago, thus:—

The	Malay and Dyak is	*jerat.*
„	Sunda	„ *jiret.*
„	Batavian	„ *jirat.*
„	Tagala	„ *dalat.*

The Dyaks also call this trap *penjuk.*

The word *jerat* means literally a running noose, and the full name of the trap would be *jerat burong* = bird noose, or *perankap jerat burong* = trap-noose-bird.

The *jerat* consists of the following parts:—

Fig. 2. *a.* The *Tidat* or trigger.
b. The *Bunkang*, or hoop.
c. The *Peningkas*, or catch.
d. The *Ambar*, or noose-cord.
Fig. 1. *e.* The *Pantar*, or platform.
f,f. The *Liar*, or guard-sticks.
g. The *Baur*, or spring.
h. The *Sabar* or *Pagar*, or fence.

The *Bunkang* or hoop (Malay, Jav., Sund., *benkang*, curved) is of pliable wood, about the thickness of a lead pencil, and the size of a croquet hoop. It is firmly fixed in the ground.

The *Tidat*, or trigger, is a small stick about three inches long. Its upper end is tied to the cord or *ambar* about two feet from the noose-end.

The *Peningkas*, or catch, is simply a stick rather longer than the width of the *bunkang*, or hoop.

The *Ambar*, or noose-cord, is of twisted bark, or, where obtainable, of stout string, the noose being a variety of running bowline. This is the real *jerat*. The word *ambar* may, perhaps, be allied to *ambur*, *hambur*, spread, but this is doubtful, as *ambur* means rather to spread about as in sowing rice, than to spread wide open.

The *Pantar*, or platform (? Malay *pantat*, a base or bottom), consists of four or five straight sticks about nine inches long.

The *Liar* are only sticks placed on each side of the *bunkang*, or hoop, to protect it.

The *Baur*, or spring, is a flexible stick which acts exactly like the stick in a common mole-trap.

The *Pagar*, or fence, is rapidly made by cutting branches, sticking them in the ground at an angle, and bending them so as to roughly catch. It is only made about eighteen inches high.

Jerats were always used by me in preference to other traps for catching argus and other pheasants and jungle fowl.

A place is sought showing the beaten tracks of the birds, and a long *pagar* is erected, right across a valley for instance. Openings for *jerats* are left every twenty yards or so, and *jerats* are also placed across every bird track.

The *jerat* being made it is set as follows:—

The *baur*, or spring, is bent down, and the *tidat*, or trigger, passed *over* the bunkang, or hoop, the head of the trigger catching the back of the hoop. At the same time the *peningkas*, or catch, is slipped under the *tidat* and the *baur* released. The trigger is now set. The *liar* are now placed, one end on the ground, the other on the *peningkas*, and on the platform so formed the *ambar* or noose is spread, and then concealed by a few leaves.

The *pagar* is so slight that a bird could easily get through it, but they don't. When foraging, the birds are not particular where they go so long as the way is easy and the food plentiful. Hence the slightest obstacle will turn them. They saunter along the *pagar*, come to an opening and start through. The moment they step on the platform it falls, releases the trigger, up goes the *baur*, and the victim hangs suspended by the legs.

It is my favourite trap. Six can be made in an hour at no cost, and it is very effective. I have caught argus, fire-back

and Bulwer pheasants, jungle fowl, porcupine, wild cat, civet cats, &c., in them. Once we got a monkey, but a friend released him. Many times we got planduk, or mouse-deer, into *jerats* but they always got away.

II. The *Bubuang*, or *Krinkap*. (Plates V, VI.)

This is a fall trap for birds. The *bubuang* may be allied to *bubu*, a fish trap something like an eel creel, and does not seem to have any connection with *buang*, to throw out, a word which has many prefixes, but not *bu*.

The word *krinkap* I suspect to be a Dyak modification of the Malay *perankap*, a common word for a trap, signifying literally that which catches.

The *bubuang* is a clumsy contrivance used for catching jungle-fowl and pheasants. It is neither so easily made nor so effective as a *jerat*, and as it nearly always kills the victim, is not in use by the Moslem Malays. The only ingenuity about it is the trigger.

The parts of a *bubuang* are as follows:—

Fig. 3. *a*. The *Kalung*, or drop.
b. The *Tiang*, or posts.
c. The *Baur*, or spring.
d. The *Tali*, or cord.
e. The *Pagar*, or fence.
Fig. 4. *f*. The *Pungayet*, or catch.
g. The *Tuil*.
h. The *Peningkas*, or trigger.
i. The *Runut*.

A fence or *pagar* about eighteen inches high is erected, at one end of which two stout sticks, *tiang*, supporting a cross-stick in the forks, are placed. At the other end of the *pagar* a small log of wood blocks up the opening. A roof, or *lantei*, rests loosely upon the end log and also upon the *kalung*, or drop, also a block of wood.

The heavy *kalung* with the roof resting on it is hung by bark cords to the *baur*, or spring-stick, at the farther end of which a string, *tali*, connects it with a trigger.

The trigger is placed inside the pagar on the right hand. It consists of a stick, *pungayet*, with a tine, and is firmly fixed in the ground. The end of the tali is attached to a straight stick, *tuil*, which catches under the tine and rests upon the double pointed *peningkas*, or trigger. The tali thus pulls up the *tuil* and presses it upwards against the tine and downwards on to the top of the trigger.

To the upper part of the trigger a fine string is attached and passes across the trap to the opposite side where it is fastened to the trigger. This cord or *runut* is about five inches from the ground.

A bird entering the trap presses against the *runut*, the trigger gives way, releasing the *tuil*, and the *kalung* falls with the *lantei* on top of it.

The words *tiang*, *tali*, *lantei*, and *pagar*, are common Malay words signifying respectively post, cord, floor, and fence, and are not technical terms.

III. The *Kelung*. (Plate VII.)

The *kelung* now to be described is a deer trap consisting essentially of an oblong enclosure of rough poles, roofed, and having a portcullis-like door.

The word *kelung* is in universal use in the Malay states for the extensive fish-stakes which form such a feature along our shores, and I was somewhat surprised to find the name in use both by Dyaks and Malays for a deer trap. I hope to write a separate paper on fish traps, and will only here remark that the fish *kelung* is a labyrinth of split-bamboo mats leading into a central enclosure.

The deer *kelung* consists of the following parts:—

Fig. 5. The enclosure or *Pagar*, with its *tiang*, &c., as in the *bubuang*, but of course much larger.

a. The *Pintu*, or door.

b. The *Baur*, or lever.

c. The *Tali*, or cord.

Fig. 6. *d*. The *Tuil*.

e. The *Sekang*.

f. The *Peningkas*.

g. A peg with no special name.

h, *h*. The *Runut*, or lines.

The height of the *pagar* is about 6 feet (1 *depa*), and the length twice as much. The trigger is placed outside the *pagar* near the end furthest from the door.

It will be noticed that what is here called the *sekang* is the *tuil* of the *bubuang*, and the *tuil* of the *kelung* is the *pungayet* of the *bubuang*. I could get no explanation of this though I made special inquiries.

The *sekang* catches in a notch in the *tuil* at one end, and in a similar notch in the *peningkas* at the other. The *peningkas* also engages with the peg by a notch.

Two lines, *runut*, lead from the *peningkas* to the far side of

the enclosure to which they are fixed. These *runut* are made of a fine black lliana, and if string be used it is always dyed black.

In the pagar behind the *runut* a quantity of pandan (*Pandanus*) leaves and a little salt are placed as bait. The deer enter the pagar, press the runut, displace the peningkas and the door falls.[1]

IV. The *Pĕti.* (Plate VI, VIII.)

We now come to two very interesting methods of taking larger game such as pigs and deer.

The *e* is very short and the word is in sound much like the French *petit.* It may be allied to the Malay *petik,* to "touch" a stringed instrument.

The *peti* consists essentially of a spring armed with a fixed spear, and as will be shown, may help us to understand how the bow might have been produced.

The parts of a *peti* are as follows :—

Figs. 7 to 9.
- *a, a. Pangat,* or posts.
- *b. Mata siah,* or spear.
- *c. Unkrung,* or ring.
- *d. Tuil,* or trigger.
- *e.* Has no special Dyak name.
- *f. Mutan,* or band.
- *g. Runut,* or cord.
- *h. Klandu,* or toggle.

The size of the *peti* depends upon the game sought.

For pigs the *pangats* are about 1½ depas (9 feet) and the *mata siah* 1½ jenkals (11 inches). The *mata siah* is generally made of bamboo, and the binding cords and *runut* of bark cord.

Two stout posts, *pangat, a,* are firmly fixed in the ground, and to the top of one of them a tough elastic stick is bound by one end and acts as a spring. Near the end of this the *mata siah, b,* is attached. The *unkrung, c,* is a ring of plaited split rotan, about 2½ inches in diameter and half an inch wide. This is quite loose. The *tuil, d,* or trigger, is a thin stick 4 inches long, tied to the free end of the *mutan, f,* or band, which is fastened to a *pangat.* A longer stick, tough and elastic, completes this part of the mechanism.

To set the *peti* the *pangat* a^3 is pulled back towards *pangat* a^2; the *mutan, f,* is then passed round *pangat* a^3 below the *mata siah, b,* the end of the *tuil, d,* pressing against the opposite side of *pangat* a^3 as shown in the plan. The stick, *e,* is passed

[1] Deer are sometimes caught with a large Jerat, having a hook in place of a noose. I have not yet seen this in use.

beneath the *tuil*, *d*, touching it[1] and its other end sprung back to the opposite side of *pangat* a^2. Over the ends of *d* and *e*, the *unkrung*, *c*, is placed to prevent *d* and *e* flying apart; *d* and *e* by their outward pressure holding *pangat* a^3 in position.

To *pangat* a^1, at the height of the *unkrung*, is tied the *runut*, *g*. This passes through the *unkrung* and terminates at the *kălanduk*, *h*, a thin stick or toggle somewhat longer than the diameter of the *unkrung*. The *runut* is nearly horizontal.

An animal passing between *pangat* a^1 and the *mata siah* pushes the *runut* outwards, draws up the *kălanduk* which pulls off the *unkrung* and releases the *mata siah*, which flies to *pangat* a^1 with terrible force, often stabbing the victim to the heart.

The *peti* is a fearful machine by which many Dyaks have lost their lives. It has been effectively used to kill the rhinoceros. My men were well acquainted with its use, and I had to prohibit it for fear of accident. It is forbidden in Sarawak.

V. The *Pĕti Lanchar*. (Plates IX, X.)

The *peti lanchar* is even more interesting than the *peti*, combining in itself some of the principles of the bow and catapult.

It is not known to every Dyak tribe, and most of my men, Kalakas, were ignorant of it. It was, however, speedily adopted by them till I put a stop to it. In Sarawak it is not allowed to be used.

My mandore, Sali, a Sarawak Malay, made the first for me, and the names of the parts are those he gave me. None of my Dyaks knew any words to represent the parts.

Figs. 10, 11. *a*, *a*, *a*. *Tiang*, or posts.
b. *Jimbang* or *Jimbattan*, or bridge.
c. *Galang* or *Kalung*, crotched sticks.
d. *Juran*, or spring.
e. *Pungati*, or trigger.
f. *Chinchin*, or ring.
g. *Sasawat*, or string.
h. *Mata peti*, or arrow.
i, *i*. *Tukul bubu*, or pegs.

The *peti lanchar* consists of three *tiangs*, *a*, from 18 inches to 2 feet high, cleft at the ends to receive the *jimbang*, *b*, and *kalung*, *c*. These five parts form the rigid frame.

A long elastic pole, the *juran*, *d*, is fixed at one end in the

[1] It is not necessary, though preferable, for the stick to touch the *tuil*. A figure is purposely drawn with the parts free, to show the arrangement of parts.

ground and further secured by two pegs or *tukul bubu, i* (trap pegs), one on each side. These hold the *jurun* rigid while it is bent back in setting.

On the *jumbang, b,* the *chinchin,* or ring, *f,* of rotan, travels, to which is attached the *sasawat, g,* a cord of thin black creeper. The *pungati, e,* is a piece of pointed stick attached to the *tiang, a*[1], by a short cord. The arrow, or *mata peti,* is a stick or bamboo pointed at one end and notched or forked (*gingin batar*) at the other.

To set (*passang*) the *pĕti* the *jurun, d,* is bent backwards against *tiang a*[1]; the string of the *pungati, e,* is then passed over it and the butt end of the *pungati* pressed against the *jurun,* the point being inserted in the *chinchin,* or ring, *f.*

The *sasawat, g,* is led across a deer path, ths trap being hidden in the jungle. No pig or deer would pass a white *sasawat,* hence it is always black.

The victim pressing against the *sasawat,* pulls the *chinchin,* or ring, from the *pungati,* the *jurun* is released and the *mata peti* shot forward. The *mata peti* rests against the *jurun* and on the *galung.*

It is evident that such a trap fires its arrow in a very uncertain direction. Hence, where bamboo can be obtained, the *mata peti* is inserted in a bamboo on each side of which a groove is cut. The *jurun* presses against the notch as before, and the bamboo, acting as a barrel, makes the arrow fly straight.

VI. The *Peti* and the *Bow.*

It is singular that the Dyaks having invented the *peti* and the *sumpitan* never designed the bow, which is also unknown to the Malays of Borneo. Yet the *peti* contains all the elements necessary for making a bow.

The common *peti* is a bow with an arrow fixed to it, and the string attached to one end by a temporary catch. If the arrow worked loose it would shoot away when the trap was sprung.

In the *peti lanchar* a step in advance can be seen. The arrow is moveable ; but the string is still detached from the bow.

The bamboo barrel is most likely a suggestion from the *sumpitan.*

VII. *Etymology.*

A few words may be said respecting the etymology of the terms used. Not speaking the Dyak language my information was derived through Malay, and my instructors failed to give

me the meaning of many of the words. "What does *lanchar* mean?" I would ask. "Why this *is* the *lanchar*," would be the reply. As many of the Malay words are in common use it may be most of the Dyak words also are not technical terms. In the following notes D. stands for Dyak, M. for Malay:—

Jĕrat, pr. *Jer'-at*, D. and M.

Tidat, pr. *Tē-dat*, a trigger, D. and M., appears to be synonymous with *pungati*.

Bunkong, pr. Bunk'-ong, a hoop, D. and M.

Peningkas, pr. Pening'-kas, D. and M. is applied to a stick which falls to the ground from a very small distance, as distinguished from *kalung*, which falls from a height.

Liar, pr. Lē-ar, D. and M., synonymous with Malay *sabar* and *sawar*. The sticks or broken branches used to mark the route when in the forest are called by their names, which are not given by Swettenham, Maxwell, or Favre.

Pantar, D. and M., in common use in N. Borneo.

Baur, pr. Bough-rr, D. and M., an elastic stick or spring.

Kalung, D. and M., see *peningkas*.

Sĕkang, pr. S'kang, D.

Lanchar, D.

Pungati. pr. Pung'-ati, see *Tidat*.

Sasawat, pr. Sasar'-wat, D. and M., a thin cord, as distinct from *tali*, a cord which may be string or a cable. Synonymous with *runut*.

Runut, D. and M., see above.

Tukul Bubu, D. and M., Tukul = pig *bubu*; = trap.

Mata Siah, D. and M. *Mata* here means sharp. It is quite distinct from *mata*, eye. Malays here say *mata pisan*, to sharpen a knife. *Siah* is Dyak and its meaning unknown to me.

I must leave this subject to competent philologists, and here only record the little I know, because the words do not occur in ordinary dictionaries.

All the Borneo natives use pit-falls with sloping sides, like native graves, but there is nothing of particular interest in them. This paper does not pretend to be exhaustive, but merely records accurately the traps I have seen.

Explanation of Plates IV to X.

A series of figures of Borneo Traps, sketched by Mr. Skertchly, to illustrate the foregoing paper.

Plate IV, fig. 1.—The Jerat, or spring and noose trap.
„ V, „ 2.—The trigger of the Jerat, set.
„ „ „ 3.—The Bubuang, or Krinkap.
„ VI, „ 4.—The trigger of the Bubuang, set.
„ „ „ 7.—The Peti, a trap for large game.
„ VII, „ 5 and 6.—The Kelung, or deer-trap.
„ VIII, „ 8.—The trigger of the Peti, set.
„ „ „ 9.—Plan of the Peti trigger, set.
„ IX, „ 10.—The Peti lanchar.
„ X, „ 11.—The trigger of the Peti lanchar, set.

ANTHROPOLOGICAL MISCELLANEA.

Precolombian Metallurgy in Venezuela, S.A.

Mr. Hyde Clarke communicates the translation of a paper by Señor V. Marcano, on a subject of some interest—namely, the Composition of Copper Objects belonging to the epoch before the discovery of America by Columbus. It also contains a correction of Von Humboldt. Mr. Marcano says :—

The knowledge of the composition of ancient metallic objects, of which the origin and relative date are indisputable, is of great importance to the history of the progress of humanity.

M. Berthelot has already established in an obvious manner by the chemical analysis of a metal object dating from more than 4,000 years before our era, that the "age of bronze" was preceded by the "age of copper." (See the "Moniteur Industriel," June 6th, 1889.)

Once the antiquity of the metallurgy of copper established for the old world, it is interesting to make investigations in this direction for the new continent. Already Vauquelin, at the beginning of the century, had analysed a metal chisel coming from the Incas of Peru, and recently, in 1883, M. Damour had determined the composition of another similar instrument brought from Quito by Boussingault; the two objects of almost identical composition were formed of a mixture of copper and tin. (Boussingault in "Comptes Rendus," t. xcvi, p. 545.)

The anthropological explorations of Venezuela with which I was commissioned by the Government of this country in 1887, brought to light amongst the Precolombians of the littoral, a civilization which they did not expect to find amongst people considered, according to the interested accounts of Spanish historians, as barbarous tribes, no more advanced than those who wander in the savannahs of Orinoco (Dr. G. Marcano "Ethnographie Précolombienne du Venezuela, Valleés d'Aragu et de Caracas"). But the numerous excavations I worked did not reveal the least object in metal amongst the great quantity of every kind they enabled me to collect.

In spite of the explicit testimony of the historians of the conquest of Venezuela, which signalises the existence of metallic objects amongst the natives of the country, that of Humboldt denies the existence of metallurgy amongst them, founding his

assertion on the geognostic study he had made in traversing the country where he did not find any signs even of a probable auriferous stratum. The illustrious traveller explains the existence of these objects in gold amongst the Indians in their commerce from place to place with those of Cordillera, communications, however, which are far from being demonstrated. I chanced to discover near San Juan de los Morros a gold mine worked by the Precolombians, as is attested by an excavation twenty metres in diameter by at least as many in depth, made in the middle of the ridge line of the hill containing the stratum. The ore forming the almost vertical vein is a schistose rock, soft, completely disintegrated, containing gold and silver respectively in the proportion of 30 gr. and 1 kg. per ton. The ore yields at the simple washing and beating one quarter of the gold contained.

A few days ago near the village of Tequia, situated at a distance of twenty miles from Caracas, the pickaxe of an excavator uncovered several sarcophagi in earthenware containing bones, ornaments, of various substances, and a certain number of metal objects which, unfortunately, have been distributed amongst a number of persons. I was able to obtain three of these objects from which I took some filings for the purpose of analysis, the results of which form the object of this note.

The first is a circular medal bearing on one of its sides a design in chased work representing a scorpion or some such thing. Nos. II and III are pendelogues, obtained by fusion, and the execution of which is fairly well done. The analysis gave—

	I.	II.	III.
Weight of objects . ..	—	15·170g.	6 196g.
Gold	13·3	23·7	7·6
Silver	73·3	5·8	traces.
Copper	13·4	47·6	38·4
Iron	—	22·9	54·0
	100·0	100·0	100·0

One can say that No. I was made by hammering with native gold very rich in silver, and containing copper as is sometimes the case with the products extracted by myself from the gold mine as I have stated. Nos. II and III are, without doubt, the result of an alloy *ad hoc*. Within gunshot from the place where the sarcophagi were disinterred there is a vein of copper which crops out on the side of the hill, and is composed of carbonate of copper closely mixed with oxide of iron. It contains neither gold nor silver. Per contra, history mentions a gold mine worked by Indians before the conquest, situated near Tequia, but in an opposite direction to that of a copper mine. The objects analysed seem to me interesting because they show the existence in Venezuela of a Precolombian metallurgy, which, far from confining itself to the extraction of native gold, made alloys of the precious metal with that obtained by reducing the ferriferous copper ores.

Recent Anthropological Works.

Dr. A. B. Meyer, the Director of the Royal Zoological and Anthropological Museum in Dresden, has presented to the Library of the Institute a copy of his *Album von Celébes-Typen* (Dresden: Stengel and Markert). This contains thirty-seven plates, with about 250 subjects, accompanied by brief descriptive letter-press. The plates are reproduced from photographs, most of which were brought by Dr. Meyer from Celebes in 1870 and 1871.

Mr. H. Ling Roth has presented a copy of his new work, *The Aborigines of Tasmania* (Kegan Paul, Trench, Trübner & Co.). This volume contains 224 pages of text, with voluminous appendices, and is illustrated with numerous autotype plates from original drawings by Edith May Roth.

Dr. E. B. Tylor, who contributes a Preface, says, that "In the present work the recorded knowledge as to the extinct native race of Tasmania, has been brought together with, I think, an approach to absolute completeness." The following is an abridged analysis of the work:—Chapter I, Introduction; II, Form and Size of the Aborigines, Physiognomy, Hair, Colour, Odour, Motions, Pathology, Abnormalities, Physical Powers, Senses, Reproduction; III, Psychology, Government, Customs, Medicine; IV, War; V, Fire, Hunting and Fishing; VI, Nomadic Life, Habitations, Social and Marital Relations, Education, Initiatory Ceremonies, Deformations, Burials; VII, Method of wearing Hair, Painting and Tattooing, Clothing, Personal Ornaments; VIII, Astronomy, Arithmetic, Music, Drawing, Games and Amusements; IX, String, Basket-work, Stone Implements; X, Trade, Communications, Navigation, Swimming, Topography, Natural Forms, Natural History; XI, Infanticide, Population, Contact with Civilized Races; XII, Language; XIII, Osteology (by Dr. Garson); XIV, Origin.

Dr. Robert Munro has presented a copy of his new work on *The Lake Dwellings of Europe* (Cassell and Co., Lim.). This volume embodies the results of a journey through the whole of Central Europe with the view of collecting materials, by direct observation, for a course of Rhind Lectures in Archæology in 1888. The work is divided into six sections, corresponding with the number of lectures. The first deals with the settlements in Lake Zurich, Western Switzerland, and France; the second with settlements in Eastern Switzerland, the Danubian Valley, and Carniola; the third with Lake Dwellings and pile-structures in Italy; the fourth is devoted to the special character of the remains found at La Tène and in the Lake of Paladru, and to the lacustrine and marine dwellings in the Lower Rhine District and North Germany; the fifth chapter treats of the Lake Dwellings of Great Britain and Ireland; and the sixth discusses the culture and civilization of the lake dwellers of Europe. The work is amply illustrated and furnished with a copious Bibliography.

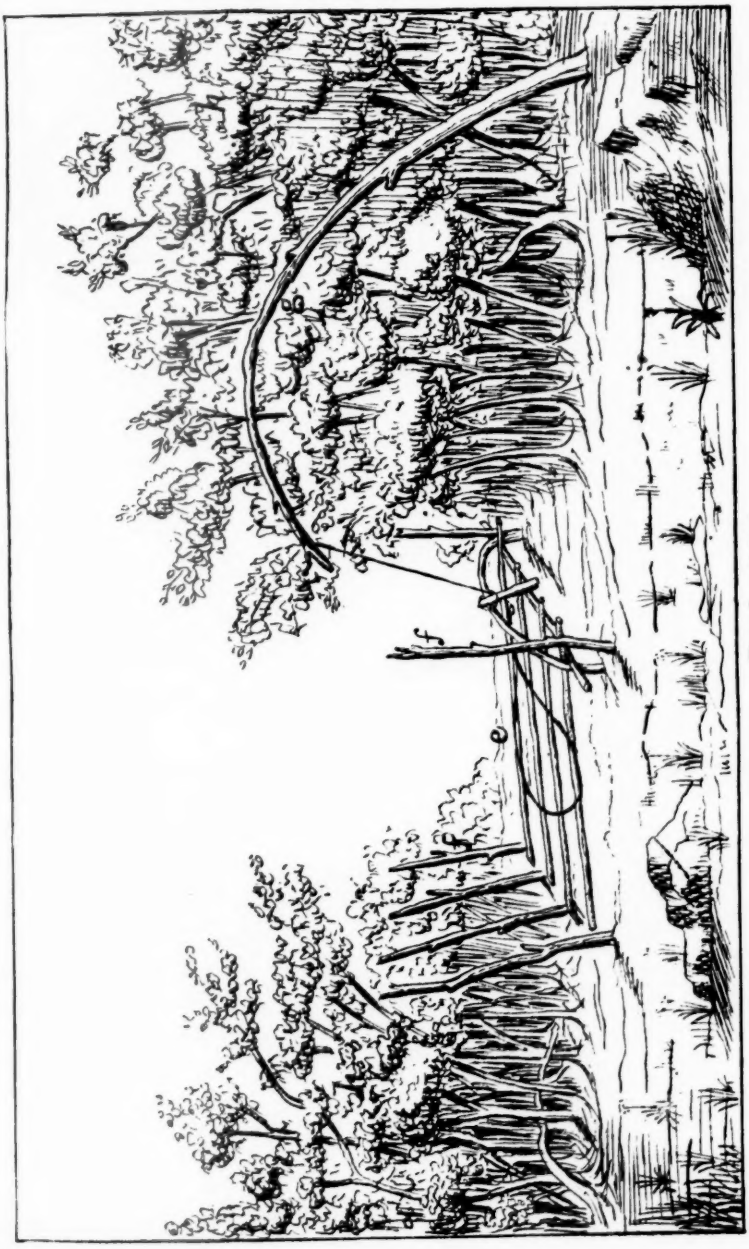
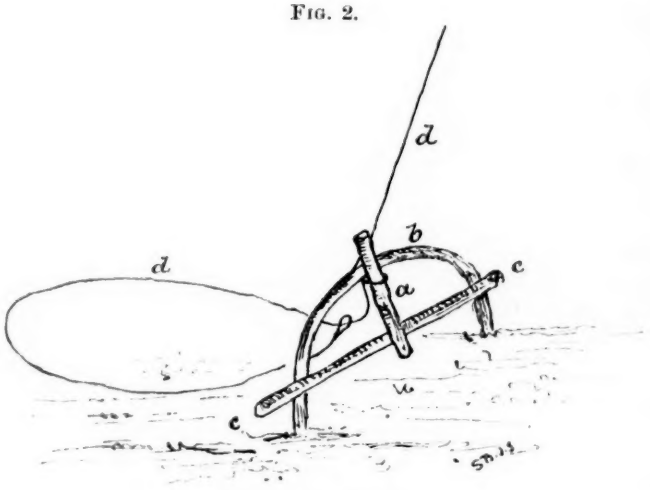


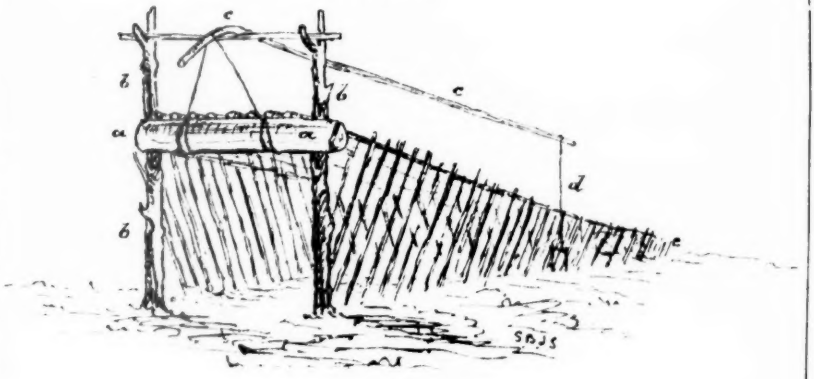
FIG. 1.—JERAT.

FIG. 2.



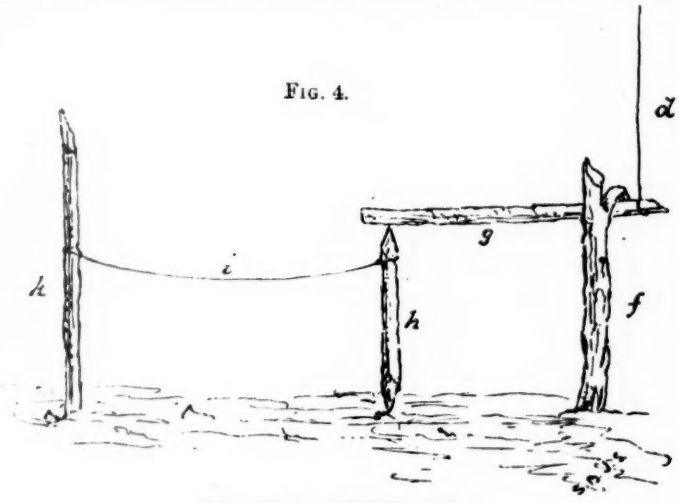
TRIGGER OF JERAT, SET.

FIG. 3.



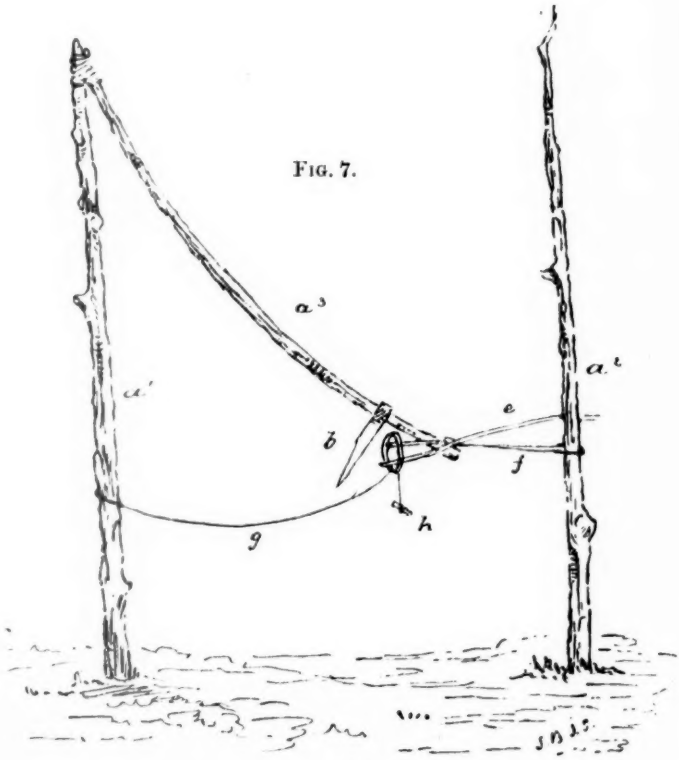
BUBUANG.

FIG. 4.



TRIGGER OF BUBUANG, SET.

FIG. 7.



PETI.

THE KELUNG.

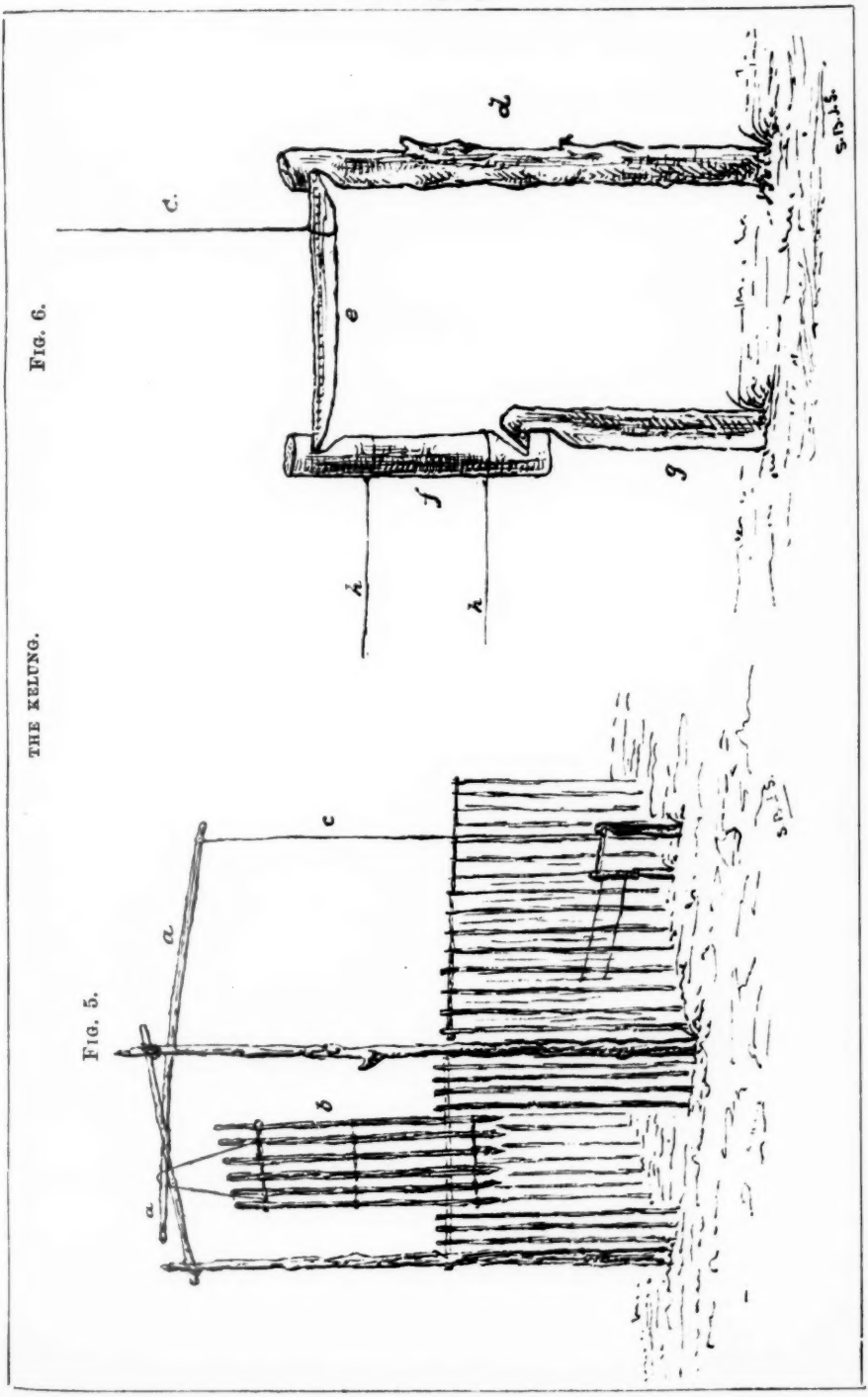


FIG. 6.

FIG. 5.

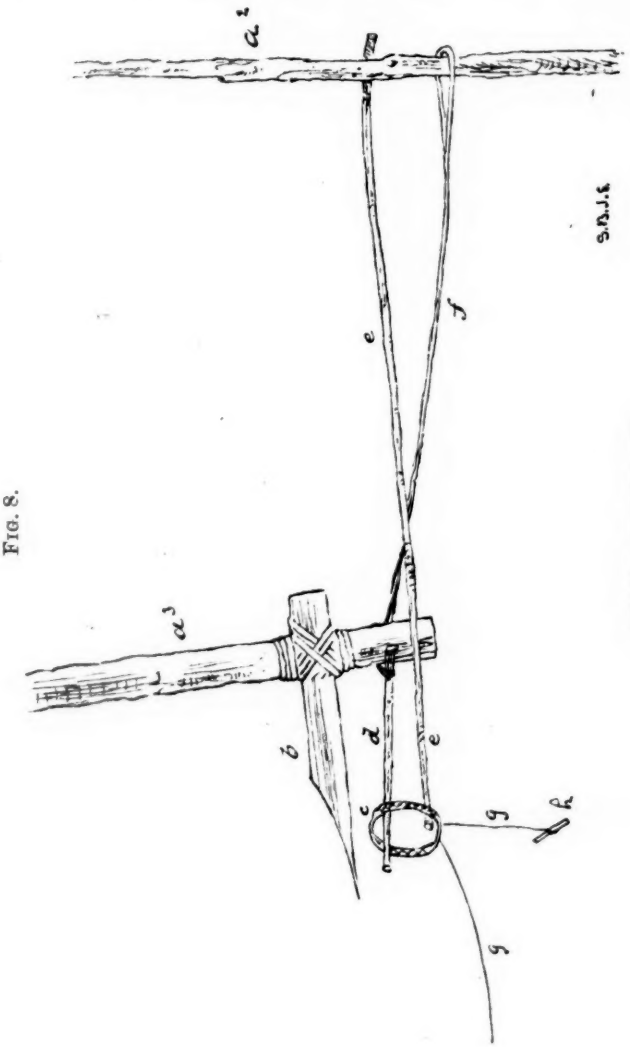


FIG. 8.

TRIGGER OF PETI, SET.

FIG. 9.

PLAN OF PETI TRIGGER, SET.

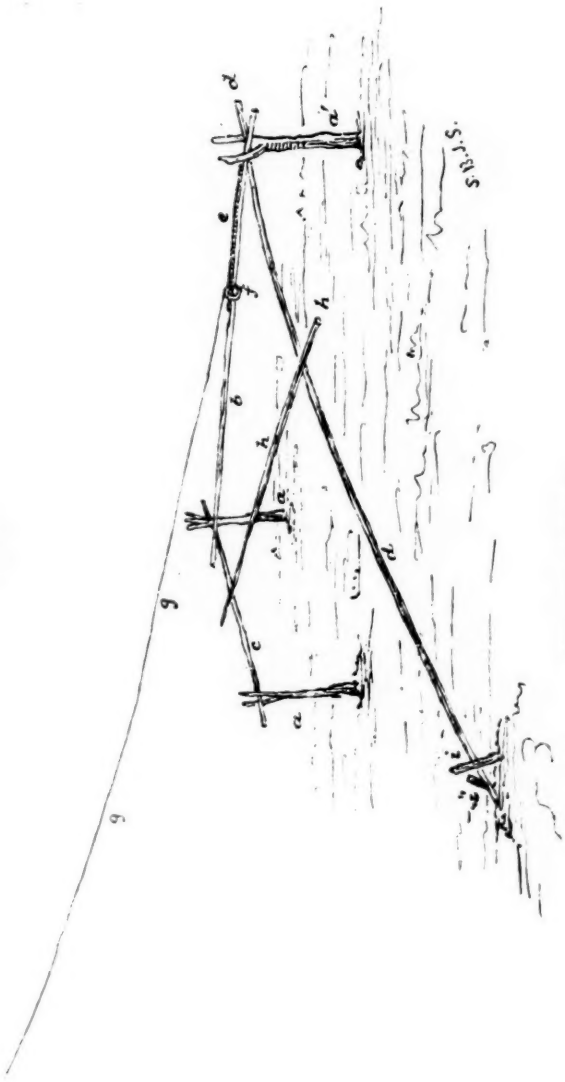


FIG. 10.

THE PETI LANCHAR.

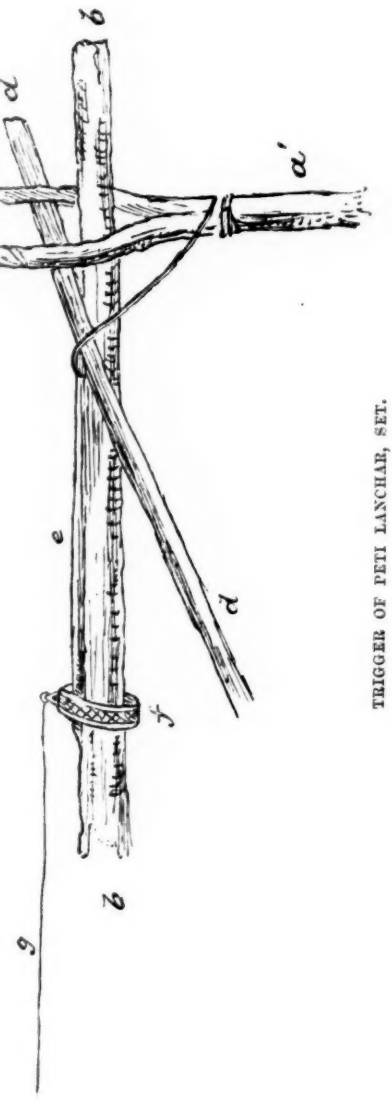


FIG. 11.

TRIGGER OF PETI LANCHAR, SET.